

No. 2—*Studies in Cuban Blattidae (Orthoptera)*

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We sometimes think of the explorations of the early naturalists in the Neotropical Region, of men such as Humboldt, Bates, and Gundlach, and of the rare pleasure that must have been theirs on discovering unusual plants and animals where white men had never been before. Undoubtedly, many strange creatures in tropical America still remain unknown to science, often in highly inaccessible places, but only a few of us have the good fortune or initiative to seek them and thereby sense a joy of achievement akin to what the pioneer naturalists have known. One of the few North American entomologists to undertake seriously Neotropical exploration during recent years is P. J. Darlington of the Museum of Comparative Zoölogy, Harvard College, who has, by his collecting trips in the West Indies, greatly extended the frontier of our knowledge concerning the fauna of those islands, and who has found, especially in the higher mountains of the Greater Antilles, many strange, endemic insects. Dr. Darlington has brought back many remarkable Orthoptera, such as the katydids *Polyancistrus* and *Polyancistroides* (see Rehn, 1936, 1937b).

The Blattidae taken by Dr. Darlington in Cuba in 1936 were loaned to the writer for study by Nathan Banks. As the study progressed, and the importance of the collection became more apparent, the writer has been increasingly appreciative of the privilege of preparing this report.

For courtesies extended to the writer while visiting the Academy of Natural Sciences of Philadelphia for the purpose of comparing types and identified material with specimens from the present collection, thanks are due to J. A. G. Rehn, Curator of Entomology at that institution. As in connection with previous orthopterological studies, the privilege to consult the Academy Collection and the Hebard Collection located at the same institution is one for which the writer is particularly grateful.

The collection consists of 142 specimens, comprising 16 genera and 31 species. Of these, 8 species and 1 subspecies are here described as new. The holotypes and allotypes have been returned to the Museum of Comparative Zoölogy. One other new species, from the U. S. National Museum, is described.

The majority of specimens were taken in Oriente Province in the mountains that characterize the eastern part of Cuba, and many were collected on the slopes or at the summit of Pico Turquino, the highest

mountain in Cuba. This peak was not climbed until 1860 (see Taylor, 1916), and, like other peaks which with it constituted an island archipelago during certain stages of Pleistocene time, has many species peculiar to it. Schuchert (1935) discussed the geological history of Cuba, and Darlington (1938), the theoretical aspects of different ways in which the animals of the Greater Antilles may have been established, with reference to the principal animal groups for which population statistics of genera and species are available. Bates (1935) and Barbour (1923) have briefly treated the topography and geology of Cuba, and Rehn and Hebard (1927) published a guide to the West Indian Blattidae which is important in all future work on the roach fauna of those islands.

As a result of Dr. Darlington's collecting, series are now available of several species described by Rehn and Hebard in 1927 from one or very few specimens. The male of *Aglaopteryx mira* Rehn is here described for the first time. Especially in the case of *Cariblattoides instigator* R. & H. (see figs. 22, 23), the acquisition of a series shows that a great deal of variation occurs. Two of Bolivar's species described in 1888, *Pseudosymploce excisa* and *Epilampra cubensis*, have been "rediscovered." Modification of the generic limits of *Nelipophygus* has seemed advisable after studying a new species, *banksi*, which differs from the original generic diagnosis, but not sufficiently to warrant the proposal of a new generic name for it. Because the 1927 monograph by Rehn and Hebard is well supplied with keys and illustrations, it has not seemed necessary to prepare keys to species for all genera treated, but several keys have been given to supplement earlier ones, as in *Eurycotis*, to which several species have been added since 1927.

Some important observations have recently been made by Quadri (1940) on the male genitalia of *Blatta orientalis* L. and *Periplaneta americana* (L.). He describes four parts of the inner genitalia, left and right dorsal penis valves and left and right ventral valves. In the third instar the left ventral valve is incompletely separated from the left dorsal valve,<sup>1</sup> but is earlier differentiated and is distinguished in the adult on the basis of this interpretation. Following Snodgrass (1937), the writer uses "phallomere" rather than "penis valve." The *Blattella* type of genitalia (see Snodgrass, l. c., p. 47) is not discussed by Quadri. In valuable museum specimens of roaches it is not always advisable to make the dissections necessary for determination

<sup>1</sup> It is stated in Quadri's paper (p. 145) that in this stage the left ventral penis valve is incompletely separated from the right dorsal penis valve, but reference to the illustration indicated by Quadri (pl. 4, fig. 30) suggests that "left dorsal valve" is intended instead of "right dorsal valve."

of the exact homologies of visible phallomeres. In addition to the phallomeres, and the supraanal and subgenital plates which have long been used taxonomically, the paraprocts often constitute important characters (see Gurney, 1939, for a treatment of the paraprocts of *Nestoblatia*).

For the assistance of students, the following list of West Indian Blattidae described since 1927 is given. The islands of Tobago, Trinidad, Bonaire, Curaçao, and Aruba are usually not considered West Indian in their affinities, and the species recorded from them are included simply for the sake of completeness.

- Aglaopteryx occulta* Rehn 1932. Bermuda.  
*Aglaopteryx mira* Rehn 1932. Cuba.  
*Aglaopteryx devia* Rehn 1932. Puerto Rico.  
*Aglaopteryx absimilis* Gurney 1937. Puerto Rico.  
*Aglaopteryx vegeta* Rehn 1932. Jamaica.  
*Cahita miscella* Rehn 1937. Tobago.  
*Cariblatia adrena* Rehn 1932. Hispaniola.  
*Cariblatia faticana* Rehn 1930. Cuba.  
*Cariblatia spinicauda* Hebard 1929. St. Vincent; Grenada.  
*Cariblatia tobagensis* Hebard 1929. Tobago.  
*Eurycotis histrio* Rehn 1937. Hispaniola.  
*Eurycotis improcera* Rehn 1930. St. Croix.  
*Eurycotis lixa* Rehn 1930. Jamaica.  
*Hormetica pustulata* Hebard 1929. Bonaire (north of Venezuela).  
*Nesomylacris fratercula* Rehn 1930. Cuba.  
*Pseudosymploce personata* Rehn 1930. Puerto Rico.  
*Styphon bakeri* Rehn, new genus and new species. Bonaire; Aruba; Curaçao.

It should be noted, in addition, that *Sibylloblatia* was proposed by Rehn, 1937, for *Polyzosteria panesthoides* Walker of Jamaica.

Except for a few specimens so noted, all the material recorded in this paper is from Cuba. Some information, which is helpful in locating localities mentioned on pin labels, is given by Darlington (1937) in a paper on carabid beetles taken on the same trip.

#### Subfamily PSEUDOMOPINAE

##### The Genus *AGLAOPTERYX* Hebard

*Aglaopteryx* Hebard, Mem. Amer. Ent. Soc., No. 2, p. 30, 1917, (genotype, *A. gemma* Hebard, by original designation).

A synopsis of this genus by Gurney (1937) has recently appeared.

*Key to the Cuban Species of Aglaopteryx*

- Small, length of pronotum about 3 mm.; interocular width less than three-fourths the distance between antennal sockets; male subgenital plate with left style slender and acuminate (see Rehn, 1932, pl. 7, fig. 2).....*diaphana* (Fabricius)
- Large, length of pronotum about 4.5 mm.; interocular width three-fourths or more the distance between antennal sockets; male subgenital plate without well developed left style, as in fig. 24  
*mira* Rehn

## AGLAOPTERYX DIAPHANA (Fabricius)

*Blatta diaphana* Fabricius, Ent. Syst., vol. 2, p. 11, 1792.

*Material here recorded.* 1 female, coast below Pico Turquino, Oriente Province, June 26-30, 1936 (P. J. Darlington) (M. C. Z.).

This specimen agrees with the descriptive notes by Rehn (1932), who pointed out that the identity of this species had been largely misunderstood by previous workers. Measurements are as follows: Length of body 8.8 mm., of pronotum 3 mm., of tegmen 6.35 mm., of hind tibia 4.5 mm.; width of pronotum 4.6 mm.

## AGLAOPTERYX MIRA Rehn

## Fig. 24

*Aglaopteryx mira* Rehn, Trans. Amer. Ent. Soc., vol. 58, pp. 110-112, pl. 7, figs. 8-10, 1932.

*Material here recorded.* 1 male, 5 females, 1 nymphal male, Pico Turquino (south side), Oriente Province, 3,000-5,000 feet, June 1936 (P. J. Darlington) (M. C. Z. & U. S. N. M.).

The species has hitherto been known only from three females. The present series of females agrees essentially with the original description. Differences in the distention of the abdominal segments account mainly for variation in body length, 11 to 15 mm., and in part for the fact that the tegmina of two specimens do not quite reach the apex of the abdomen. The two spots on the face between the antennal sockets figured by Rehn (1932, fig. 9) are not noticeable. The pronotal length varies from 4.3 to 4.8 mm.

*Male.* Essentially the same as female; tegmina and wings surpassing apex of abdomen by about one-half of length of cercus; interocular width three-fourths the distance between antennal sockets. Supraanal plate transverse, apex barely emarginate. Subgenital plate (fig. 24)

with left posterior angle broadly rounded, margin noticeably decurved; a flap along right lateral margin abruptly bent in apical third, thus extending posteriorly and in a vertical plane; a blunt, swollen, bifid, median projection on posterior margin, the surface of left lobe heavily rugose; a triangular, acute projection to the left of the bifid process.

Coloration. About as in female; disk of pronotum with side arms of an inverted anchor-shaped mark poorly developed, these arms connected by short marks to middle region of inner margin of each pronotal bar. Subgenital plate pale brown, darker on lateral borders and on bifid apical process; supraanal plate pale.

Measurements. Length of body 12 mm., of pronotum 4.5 mm., of tegmen 10.5 mm., of hind tibia 5.5 mm.; width of pronotum 6 mm.

The male nymph is 11.5 mm. long. In addition to the well-marked longitudinal pronotal bars, the disk of the pronotum has a conspicuous brown dot on each side, and along the middle line between them there is a weak longitudinal stripe which divides posteriorly. About eight brown dots occur on the posterior margin of the pronotum. The abdominal terga are spotted with brown, terga 4 and 5 more heavily so than the others.

#### The Genus *CARIBLATTA* Hebard

*Cariblatta* Hebard, Trans. Amer. Ent. Soc., vol. 42, p. 147, 1916, [genotype, *Blatta punctulata* Beauvois (replaced by *delicatula* Guérin because of pre-occupation), by original designation].

This very characteristic West Indian genus of small, active roaches, represented by 23 species on the islands, is poorly represented in Cuba as regards number of species. *Cariblatta faticana* Rehn is known from a single female from Turquino Peak.

#### *Key to the Cuban Species and Subspecies of Cariblatta*

1. Pronotal pattern consisting of numerous dots of different sizes and more or less parenthesis-shaped marks; tegminal veins without conspicuous nodes.....2
- Pronotal pattern essentially limited to two conspicuous dots on disk; most of costal veins and discoidal sectors of tegmen bearing on their dorsal surfaces one or more low rounded nodes.  
*faticana* Rehn
2. Tinged with olivaceous; tegmina surpassing apex of abdomen, the latero-posterior angles of the pronotum being broadly rounded and the point of greatest pronotal width being about one-third

- of the pronotal length anterior to the posterior margin; wings fully developed. . . . . *delicatula* (Guérin)  
 Tinged with cinnamon; tegmina not reaching apex of abdomen except rarely, in short-tegmined specimens the latero-posterior angles of the pronotum being abruptly rounded and the point of greatest pronotal width being near posterior margin; wings vestigial. . . . . *lutea minima* Hebard

CARIBLATA DELICATULA (Guérin)

*Blatta (Phyllodromia) delicatula* Guérin, in La Sagra, Hist. Phys. Polit. Nat. Cuba, pp. 346-347, 1857.

*Material here recorded.* 1 male, 1 female, Maisi, Oriente Province, July 17, 1936; 2 males, mountains north of Imias, Oriente Province, 3,000-4,000 feet, July 25-28, 1936; 2 males, Loma del Gato, Cobre Range, Oriente Province, about 3,000 feet, July 3-7, 1936; 1 male, 1 female, Pico Turquino (south side), Oriente Province, 2,000-5,000 feet, June 1936; 1 female, same, 1,500 feet, June 25, 1936; 4 males, 4 females, coast below Pico Turquino, Oriente Province, June 26-30, 1936; 1 male, Buenos Aires, Trinidad Mts., Santa Clara Province, 2,500-3,500 feet, May 8-14, 1936; 2 females, Soledad (near Cienfuegos), Santa Clara Province, April 1936 (P. J. Darlington) M. C. Z. & U. S. N. M.).

The above material demonstrates the great variation found in this species which has already been discussed by Hebard (1916a, pp. 158-163) and Rehn and Hebard (1927, pp. 25-29). No species could better show the need for larger series in order to understand the amount of variation within a species or illustrate more clearly the fact that male genitalia, as well as other structural features, may vary widely. The posterior margin of the male subgenital plate varies from slightly concave to produced into a short median tongue. In one male (Buenos Aires) the projection is square, with a truncate apex; the projection in other specimens possessing a median tongue is bluntly rounded or triangular. The style at each latero-posterior angle varies from a tiny lobe armed at the base with a strong, curved spur and a small accompanying spur to an elongate lobe armed with several spurs of various lengths along its outer and apical margins. Body size likewise varies greatly, the tegminal length ranging from 6.5 to 11 mm. in the male. There is an opportunity here for a fine contribution by some West Indian student interested in biology of insects who could rear this

species in quantity in order to tabulate the variation occurring in the progeny of known original stock.

#### CARIBLATTA LUTEA MINIMA Hebard

*Cariblattea lutea minima* Hebard, Trans. Amer. Ent. Soc., vol. 42, pp. 170-172, pl. 13, fig. 4, 1916.

*Material here recorded.* 2 females, Soledad (near Cienfuegos), Santa Clara Province, April 1936; 1 female, same, May 1936 (P. J. Darlington) (M. C. Z. & U. S. N. M.).

Readers are referred to Hebard (1917, pp. 50-56) and Rehn and Hebard (1927, p. 29) who have discussed this roach. The present subspecies occurs in Cuba and in the central and southern portions of Florida. *C. lutea lutea* (S. & Z.) is known from northern Florida to Cape Henry, Va., and westward to Natchez, Miss. The male subgenital plate of *minima* bears at each latero-posterior angle a short lobelike style armed with curved spurs. The posterior margin has a subquadrate median projection. It is unusual for a median projection of this shape to occur in *delicatula*, but the genitalia may not be depended upon to separate the two species.

In addition to the distinguishing features noted in the key, the interocular distance of *minima* averages somewhat greater than that of *delicatula*. The differences in pronotal shape represent the progressive changes that occur in many species as an accompaniment of brachypterism. The only recorded specimen with long tegmina is the one from Baños de San Vicente, Pinar del Rio Province, Cuba, mentioned by Rehn and Hebard (l. c., p. 29). No specimens with long wings are known.

#### The Genus CARIBLATTOIDES Rehn and Hebard

*Cariblattoides* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, p. 48, 1927 (genotype, *C. suave* Rehn and Hebard, by original designation).

Only the originally described species, *suave* and *instigator*, are known, but additional material suggests certain modifications in the key prepared in 1927. *C. instigator* was based on one male and five nymphs, and the present series of nine individuals, including two females, shows that much variation occurs. Three previously unrecorded males of *suave*, one from Rio Piedras, P. R., and two from Puerto Rico intercepted in quarantine at San Francisco, give further information about that species.

*Key to the Species of Cariblattoides*

- Pronotum with two posteriorly diverging longitudinal dark bars on disk; tegmen with pale borders on both costal and anal margins; head with a distinct, transverse, dark interocular bar; male subgenital plate (figs. 22, 23) with both sides about equally developed. (Cuba).....*instigator* Rehn and Hebard
- Pronotum with disk entirely dark, the dark area narrowing anteriorly; tegmen with pale costal border, anal margin entirely dark; interocular area often darkened, but not in a sharply defined bar; male subgenital plate (Rehn and Hebard, l. c., pl. 3, fig. 4) with left side much more developed and produced posteriorly than right side. (Puerto Rico).....*suave* Rehn and Hebard

## CARIBLATTOIDES INSTIGATOR Rehn and Hebard

Figs. 22, 23

*Cariblattoides instigator* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54: art. 1, pp. 52-54, pl. 3, figs. 6-9, 1927.

*Material here recorded.* 1 male, mountains north of Imias, 3,000-4,000 feet, July 25-28, 1936; 1 male, 2 females, Gran Piedra Range (near Daiquiri, between Santiago and Guantanamo), 2,000-3,000 feet, May 30-31, 1936; 1 male, summit of Pico Turquino, 6,000 feet, June 16-21, 1936; 1 male, Pico Turquino (south side), 3,000-5,000 feet, June 1936; 2 males, same, 1,500 feet, June 25, 1936; 1 male, coast below Pico Turquino, June 26-30, 1936. All Oriente Province (P. J. Darlington) (M. C. Z. & U. S. N. M.).

In the present series the fifth (apical) segment of the maxillary palpus averages distinctly shorter than the fourth, but not so much so as in *suave*. The number of small spines on the ventro-anterior margin of the front femur ranges from 8 to 13 with an average of 10.8; the range is 9 to 10 in the 2 females. In the 3 herein recorded males of *suave*, the spine range is 7 to 9. The number of tegminal discoidal sectors is 5 to 7 and 5 to 6, respectively, in the males and females of *instigator*, 6 to 7 in *suave*.

The most conspicuous variation of *instigator* occurs in the male subgenital plate. One specimen (mountains north of Imias) (fig. 23) has a slender projection of the posterior margin of the subgenital plate, the styles being specialized as groups of strong curved spurs arising from a non-sclerotized area at the apex of each latero-posterior extension of the subgenital plate. Four specimens are as in fig. 22.



In this type there is no median projection, but there is a deep emargination, while the styles arise from an unsclerotized area that is formed on the same plan as in fig. 23 except for less specialization. There is a thin, partly transparent area at the base of the median apical emargination. A specimen from the south side of Pico Turquino is about as illustrated by Rehn and Hebard (l. c., pl. 3, fig. 9) as regards the median projection and the general shape of the subgenital plate, but the styles are represented by clusters of spurs about as in fig. 22. The single male from the summit of Pico Turquino is much like fig. 23 except that the styles converge so that they virtually meet near the tip of the median projection, curving so that an opening is left along each side of the median projection. This male likewise differs from the other specimens, perhaps in response to the high altitude, by being of darker general coloration (the venter of the abdomen is mostly brown except for pale margins and a few spots), by the tegmina not quite reaching the apex of the abdomen, by the wings being vestigial, and by the pronotum being more semicircular than transversely elliptical as a result of brachypterism. If this specimen actually represents a population restricted to high elevations, it probably is a distinct subspecies of *instigator*. Further collecting may supply information on this subject. In two males of the above series the supraanal plate is narrowly incised apically; the apex of the others is entire. In each of two males there is a right phallomere extruded, which is in the form of a slender, curved, and somewhat twisted hook, recurved apically and armed with two sharp teeth. Tegminal length of the normal males varies from 9.5 to 11 mm. Measurements of the short-winged male from the summit of Turquino follow: Length of body 7 mm., of pronotum 2.4 mm., of tegmen 5 mm., of hind tibia 3 mm.; width of pronotum 3.5 mm. Females agree essentially with males in color and structure. The interocular space is not noticeably wider in the female. The female supraanal plate is transverse, weakly bilobed at the apex, and the apical margin has sparsely distributed, long, slender, spinelike setae. The subgenital plate is simple, scooplike, extending about half its length beyond the supraanal plate; it is pale buff, darker along the lateral margins. Measurements of a female are as follows: Length of body 8.2 mm., of pronotum 2.5 mm., of tegmen 10.8 mm., of hind tibia 3.9 mm.; width of pronotum 3.4 mm.

#### The Genus *NEOBLATTELLA* Shelford

*Neoblattella* Shelford, Ent. Mo. Mag., vol. 47, p. 155, 1911 (genotype, *Blatta adspersicollis* Stål, by original designation).

Few American genera of Blattidae are comparable to *Neoblattella* in the rich number of species, but only two species are known from Cuba, one of them here described as new.

*Key to the Cuban Species of Neoblattella*

- Posterior margin of male subgenital plate (fig. 32) prominently incised and with a small spine each side of emargination  
*guanayara*, new species
- Posterior margin of male subgenital plate (fig. 38) not incised and without spines. . . . . *vatia* Rehn and Hebard

NEOBLATTELLA VATIA Rehn and Hebard

Fig. 38

*Neoblattella vatia* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, pp. 63-66, pl. 5, figs. 1-6, 1927.

*Material here recorded.* 1 male, Upper Ovando River (the mouth of which is just south of Cape Maisi), Oriente Province, 1,000-2,000 feet, July 17-20, 1936; 1 female, Loma del Gato, Cobre Range, Oriente Province, about 3,000 feet, July 3-7, 1936; 1 male, Pico Turquino, Oriente Province, 5,000-6,000 feet, June 1936; 1 male, same, 6,000 feet (summit), June 16-21, 1936; 4 males, 2 females, same, 3,000-5,000 feet (south side), June 1936; 1 male, same, 1,500 feet, June 25, 1936.

The origin of the holotype is unknown, beyond that it is from Cuba, but the other original material is from Pinar del Rio and Havana Provinces. The apex of the male subgenital plate is not produced in a swollen protuberance nearly so much in the types as in the present series (fig. 38), but all evidently represent the same species. Within the present series some variation occurs. Further collections may show that the population in eastern Cuba is a distinct subspecies. The apical margin of the male subgenital plate separates *vatia* from *guanayara* (figs. 32, 38). The tegmina of two males (5,000-6,000 feet, and summit of Turquino) are noticeably shorter than those of the other specimens here recorded. The tegmen of the male from the summit of Turquino is 10 mm. long; that of the male taken at 1,500 feet is 17 mm. long.

NEOBLATTELLA GUANAYARA, new species

Fig. 32

*Male* (holotype). Differing from *vatia* especially in subgenital plate. Head with interocular space narrower than distance between antennal

sockets (as 2.7 to 3.6); pronotum slightly more transverse, rather more delicate than in *vatia*; ulnar vein of wing with four complete rami, each of the two most apical ones twice furcate; axillary vein with two branches, the basal one furcate near its base and each fork furcate about midway of its length; apical margin of supraanal plate narrowly concave, the margin of concavity appearing as two obtuse angles (this condition occurs in some males of *vatia*, in others the margin is entire). Subgenital plate with a large hooked style at each postero-lateral angle, as in fig. 32 in ventro-posterior view; a small curved spine near base of each style; apical margin weakly obtuse-angulate (in ventral view), prominently incised; a small curved spine each side of emargination; a median, slightly oblique, longitudinal ridge in posterior half of plate, culminating in a protuberance extending ventrad of emargination; lateral portions of plate abruptly curved dorsad and situated nearly vertically, serving as bases for respective styles.

**Coloration.** In general, light straw-colored, much as in *vatia*. Eyes black; interocellar area light brown with a pale central spot enclosed with dark; antenna brown, pale at base; pronotum, tegmina, wings, legs, and abdomen as in *vatia*; supraanal and subgenital plates light brown; cereus whitish yellow above, margined laterally with brown, ventral surface of segments pale, blotched basally and margined laterally with brown.

**Measurements.** Length of body 11.5 mm., of pronotum 3.5 mm., of tegmen 15 mm., of hind tibia 6.5 mm.; width of pronotum 4.7 mm.

**Female** (allotype). Interocular area slightly wider than in male, in respect to distance between antennal sockets as 3 to 3.8; supraanal plate with a V-shaped emargination as in *vatia*; subgenital plate simple, scooplike, extending somewhat beyond supraanal plate.

**Coloration.** As in male; supraanal plate brown on base, apical half pale; subgenital plate dark brown, darkened on margins, pale on central part of disk, a pale basal blotch with dark-brown dot on each lateral border.

**Measurements.** Length of body 10.8 mm., of pronotum 3.6 mm., of tegmen 14.7 mm., of hind tibia 6.2 mm.; width of pronotum 4.7 mm.

**Type locality.** Buenos Aires (about 17 miles northwest of Trinidad), Trinidad Mts., Santa Clara Province, Cuba.

**Type.** Museum of Comparative Zoölogy.

The type and allotype were taken by P. J. Darlington at the type locality, 2,500-3,500 feet, May 8-14, 1936. Buenos Aires is near the headwaters of the Rio Guanayara and the Rio San Juan, from the former of which the specific name is taken.

The Genus *PSEUDOSYMPLOCE* Rehn and Hebard

*Pseudosymploce* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art 1, p. 103, 1927, (genotype, *P. schistopyga* Rehn and Hebard, by original designation).

Since 1927, Rehn (1930) has described *personata* from Puerto Rico, and now *excisa* (Bol.) has been taken in Cuba, doubling the number of species reported from American collections when the revision of West Indian roaches was written. Both *personata* and *excisa* have four complete rami of the ulnar vein of the wing, and the tegminal discoidal sectors of *excisa* are weakly oblique, thus modifying slightly the original generic description, which states that the complete rami are three in number and the discoidal sectors are longitudinal. The descriptions and illustrations of the 1927 revision should be consulted in conjunction with the key below.

*Key to the Species of Pseudosymploce*

1. Noticeably bicolored, anterior and lateral margins of pronotum and costal margin of tegmen yellow in contrast to dark-brown basal color; apex of female supraanal plate entire. (Discoidal sectors of tegmen about 12 in number.) (Puerto Rico)

*personata* Rehn

General color uniform, either solid blackish brown or pale tinged with auburn or rufous; apex of female supraanal plate bilobate or emarginate. . . . . 2

2. Large, blackish brown, tegminal length about 20 mm. or more; head entirely black or blackish brown except clypeus, which is pale brown; discoidal sectors of tegmen about 12. (Cuba)

*excisa* (Bolivar)

Smaller, reddish brown to pale, tegminal length about 14–17.5 mm.; head not nearly so uniformly dark as in *excisa*; discoidal sectors of tegmen about 8. . . . . 3

3. Posterior margin of male supraanal plate with median emargination much broader than length of posterior processes. (Jamaica)

*schistopyga* Rehn and Hebard

Posterior margin of male supraanal plate with median emargination no broader than length of posterior processes. (Hispaniola)

*elongata* (Beauvois)

## PSEUDOSYMPLOCE EXCISA (Bolivar)

*Iscnoptera excisa* Bolivar, Mém. Soc. Zool. France, vol. 1, p. 124, 1888.

*Material here recorded.* 1 female, mountains north of Imias, Oriente Province, 3,000–4,000 feet, July 25–28, 1936 (P. J. Darlington) (M. C. Z.)

This specimen agrees very closely with Bolivar's description and, except as already noted, fits the original generic description perfectly. According to Gundlach (1890–91, p. 303), Bolivar's material came from Yateras, Oriente Province; this is scarcely 30 miles from Imias. The rediscovery of *excisa*, unknown since its description more than a half century ago, is of genuine interest.

*Female.* Large for genus, rather robust; surface smooth and glossy. Narrowest width of interocular space slightly wider (about as 5.5 to 5) than distance between antennal sockets; eye extending far ventrally, to a point fully one-half distance between level of ventral margin of antennal socket and lateral articulation of mandible. Maxillary palpus with segments 5 and 4 subequal in length, each slightly shorter than segment 3; segments slender, apical one very shallowly, triangularly hatchet shaped in lateral view. Pronotum as in *elongata*. Tegmen exceeding tips of cerci by distance about equal to pronotal length; number of costal veins about 20; discoidal vein forked about midlength of tegmen, the posterior branch forked one-fifth the distance from origin of vein to apex; discoidal sectors 12 (inclusive of ulnar vein and exclusive of posterior fork of discoidal vein), weakly oblique. Wing reaching about to apex of tegmen; costal veins 14, including mediastine vein, which extends across bases of about 6 costal veins, forming about 7 closed cells anterior to middle third of discoidal vein; median vein simple; ulnar vein with 4 complete and 3 incomplete rami; intercalated triangle about one-fifth as long as length of anal sulcus; axillary vein with 2 simple branches, in addition to main stem; radiate veins 13. All femora much compressed; ventro-anterior margin of front femur with 8 large spines, the apical 2 considerably shorter than the others, then 8 small, uniform, setalike spines; other legs about as in *elongata*. Supraanal plate transverse, moderately produced, the apex with deep, broadly V-shaped emargination; subgenital plate simple, bluntly rounded at apex, noticeably surpassing supraanal plate posteriorly.

*Coloration.* General color blackish brown; tegmen tinged with metallic luster; pronotum mostly dark reddish brown except for a darker, wide, posterior border; eyes blackish; occiput and face dark reddish brown; clypeus paler; antennal sockets and ocellar spots light yellow; antenna light brown, darker at base; maxillary palpus brown, apical segment pale in apical half; legs brown; wing hyaline, fuscous along anterior border and in apical third of anterior field; abdomen

dark brown, lighter in middle region of venter; cerci and supraanal plate dark.

Measurements. Length of body 17 mm., of pronotum 5.4 mm., of tegmen 21.5 mm., of hind tibia 8.5 mm.; width of pronotum 6.4 mm.; greatest width of tegmen 6.5 mm.

### The Genus *ISCHNOPTERA* Burmeister

*Ischnoptera* Burmeister, Handb. Ent., Bd. 2, Abt. 2 (1st half), p. 500, 1838, (genotype, *Ischnoptera morio* Burmeister, designated by Kirby, 1906).

Many species of *Ischnoptera* inhabit Central and South America, but only three have been found in Cuba. Elsewhere in the West Indies, *podoces* R. & H. and *orcochares* R. & H. occur in Jamaica, *rufa rufa* (Deg.) is widely distributed in the Greater and Lesser Antilles, and *ligula* R. & H. was recorded from Hispaniola by Rehn and Hebard (1927, p. 119) on the basis of two females.

#### Key to the Cuban Species and Subspecies of *Ischnoptera*

1. Large, chestnut colored, width of pronotum usually at least 5 mm., occasionally about 4 mm.; apex of male supraanal plate (Hebard, 1916b, pl. 16, fig. 3) entire.....*rufa rufa* (Degeer)  
Smaller, usually less reddish, width of pronotum about 2.5 to 3.5 mm.; apex of male supraanal plate (fig. 25, 31) conspicuously emarginate.....2
2. Male supraanal plate (fig. 31) very deeply incised, appearing asymmetrically bilobed.....*darlingtoni*, new species  
Male supraanal plate very differently emarginate from above, about as in fig. 25.....*ligula* Rehn and Hebard.....3
3. Robust; length of tegmen about 10-11 mm.; middle part of apex of male subgenital plate recurved dorsally, bearing a very specialized right style (fig. 26); apical emargination of male supraanal plate averaging larger (fig. 25)....*ligula collina*, new subspecies  
Less robust; length of tegmen about 8.5 mm.; apex of male subgenital plate not recurved dorsally, right style less specialized (Rehn and Hebard, l. c., pl. 9, fig. 7); apical emargination of male supraanal plate averaging smaller than above  
*ligula ligula* Rehn and Hebard

### *ISCHNOPTERA RUFa RUFa* (Degeer)

*Blatta rufa* Degeer, Mém. Hist. Ins., vol. 3, p. 539, pl. 44, fig. 7, 1773.

*Material here recorded.* 1 male, intercepted at Boston, Mass., in quarantine from Cuba, 1932; 1 male, intercepted at Norfolk, Va., in quarantine from Cuba, April 6, 1937 (U. S. N. M.).

By coincidence Brunner (1865, p. 131) used the same specific name in describing his synonymous *Ischnoptera rufa* from Brazil. Moreover, Brunner omitted reference to Degeer's *rufa* in his review (l. c., p. 30) of the work of that author. Kirby (1904) omitted Degeer's name also, but later included it (1910, p. 566) as a species of uncertain position. The synonymy of *rufa* Brunner was published by Shelford (1908, p. 8). This species should not be confused with *Blatta rufa* (Tepper) of Australia.<sup>1</sup>

This is the first Cuban record of *rufa rufa*, which elsewhere occurs throughout the West Indies and on the mainland from Nicaragua southward over much of northern South America. Hebard (1916b, 1920) has illustrated the male genitalia. The subspecies *rufa debilis* Hebard occurs "in the higher country of Costa Rica," and *rufa occidentalis* Saussure from Panama northward.

#### ISCHNOPTERA DARLINGTONI, new species

Figs. 27-31

This species is most closely related to *ligula* and *oreochares*, from both of which it differs in the male genital structures.

*Male* (holotype). General form slender; pronotum and tegmina polished. Head rather narrow in frontal view; interocular area narrower than distance between antennal sockets (as 2.5 to 3.2); face moderately inflated; segment 5 of maxillary palpus elongate-lanceolate in lateral view, about one and one-third times as long as segment 4; pronotum as in *ligula*. Tegmen exceeding apex of abdomen by distance of 5 mm.; costal veins (including mediastine vein) 21 in number; discoidal sectors as in *ligula*, 9 to 11 in number. Wing with about 19 costal veins; ulnar vein with 2 complete and 5 incomplete rami; intercalated triangle small, about one-fifth the length of anal sulcus; axillary vein with 2 branches; about 10 radiate veins. Ventro-anterior margin of front femur with 1 strong spine and several very slender, long ones along basal portion; about 12 setalike spines in apical half; 3 large spines at extremity as in *ligula*. Other legs about as in *ligula*.

Supraanal plate (fig. 31) deeply incised; right lobe deeply concave ventrally, with numerous small spines closely set along margins ven-

<sup>1</sup> Described by Tepper (1893, p. 101) as *Periplaneta rufa*. Transfer of the species to *Blatta* by Kirby (1904, p. 139) and Shelford (1910, p. 16) made this a secondary homonym. Accordingly, *Blatta tepperana*, new name, is here proposed for the Australian species.

trally; left lobe somewhat concave ventrally, a group of long, strong spines directly obliquely on inner margin, another group of spines at left near base ventrally. Subgenital plate appearing as in fig. 30 in dorso-posterior view, a median dorsally recurved flap bearing highly specialized right style (fig. 27); left style slender, acute, bearing three lateral spines. Left and right paraprocts as illustrated (figs. 28, 29), respectively.

**Coloration.** General color light brown; interocular area and dorsal part of face orange yellow; ventral part of face and palpi pale; ocellar spots white, tinged with pinkish; antenna buff, basal three segments pale. Pronotum bordered laterally and anteriorly with pale yellow; disk orange yellow, bordered with fuscous in a wide posterior border and posterior to the anterior pale border. Tegmen light brown, washed with whitish along costal margin indistinctly toward apex; apex of tegmen and posterior half of discoidal field grading into hyaline. Wing membrane colorless; costal veins clouded in middle third of wing; veins light brown. Legs pale; tarsi and spurs somewhat darker. Abdomen pale, darker toward apex ventrally and on posterior portions of terga.

**Measurements.** Length of body 9 mm., of pronotum 2.7 mm., of tegmen 12.5 mm., of hind tibia 4 mm.; width of pronotum 3.5 mm.

*Female* (allotype). General form as in male; somewhat larger and more robust. Interocular space slightly wider than distance between antennal sockets (about as 4 is to 3.7). Tegmen with about 26 costal veins; 11 discoidal sectors. Wing with 2 complete and 7 to 8 incomplete rami of ulnar vein. Front femur with 2 large spines basad of setalike spines on ventro-anterior margin. Supraanal plate transverse; apex blunt, about a right angle. Subgenital plate equal in length to supraanal plate, apical margin broadly and evenly rounded.

**Coloration.** About as in male, but slightly more tinged with orange yellow. Ocellar spots white.

**Measurements.** Length of body 9.5 mm., of pronotum 2.7 mm., of tegmen 12.5 mm., of hind tibia 4 mm.; width of pronotum 3.4 mm.

In addition to the type and allotype just described, there is 1 male paratype. The armature of the right style varies slightly from that of the type. There are about 20 costal veins in the tegmen, and the complete and incomplete rami of the ulnar vein of the 2 wings are, respectively, 2 and 6, and 2 and 5. There are 2 large spines on the ventro-anterior margin of each front femur. The coloration tends more toward fuscous and less toward orange yellow than in the type.

*Type locality.* Mountains north of Imías, Oriente Province, Cuba.



*Type.* Museum of Comparative Zoölogy.

*Paratype.* U. S. National Museum, No. 54826.

The holotype was taken at an altitude of 3,000–4,000 feet, July 25–28, 1936, by P. J. Darlington, in whose honor the species is named. The allotype is from Pico Turquino (south side), Oriente Province, 3,000–5,000 feet, June 1936. The paratype is from Loma del Gato, Cobre Range, Oriente Province, about 3,000 feet, July 3–7, 1936. The allotype and paratype also were taken by Dr. Darlington.

#### ISCHNOPTERA *LIGULA COLLINA*, new subspecies

Figs. 25, 26

This roach differs from *ligula ligula* as noted in the key, by the larger number of areolets between the discoidal and median veins of the wing, by a slightly wider interocular space, and by a smaller average number of large spines along the basal half of the ventro-anterior margin of the front femur. Typical *ligula* occurs at low altitudes in both western and eastern Cuba, and the present form appears to be a subspecies occurring at higher elevations (the name *collina* means "one who dwells among the hills").

*Male* (holotype). Interocular width less than distance between antennal sockets (about as 2.5 to 3.4) (a male paratype of *ligula ligula* is as 2.2 to 3.5); ventro-anterior margin of front femur with 1 large spine basad of a row of fine setalike spines; wing with 12 subquadrate areolets between discoidal and median veins (8 to 10 in paratypes of *ligula ligula*). Supraanal plate (fig. 25) somewhat asymmetrical at base; lateral portions recurved ventrally; apical emargination, accentuated by curvature of lateral portions, deeply rounded; numerous small setae lining apical portion within; sparse elongate setae as illustrated. Subgenital plate, as in fig. 26 in dorso-posterior view, with apical margin recurved dorsally; left style slender, gently curved, acute, bearing a small lateral spine; right style sulcate dorsally in basal half, armed with 3 heavy spines. Left paraproc bearing a slender arm, with an acute apical spine; right phallomere slender, curving dorsally, then ventrally and to the left near base of right style, bearing a curved apical spine.

*Coloration.* Essentially as in *ligula ligula*.

*Measurements.* Length of body 8.5 mm., of pronotum 2.3 mm., of tegmen 11 mm., of hind tibia 3.8 mm.; width of pronotum 3.1 mm.

*Female* (allotype). Much like male; interocular space subequal to distance between antennal sockets; about 15 areolets between discoidal and median wing veins; ulnar vein with 2 complete and 4 incomplete

rami of ulnar vein. Supraanal plate with lateral margins broadly rounded, apex shallowly and narrowly emarginate; subgenital plate with apex broadly rounded and briefly reflexed dorsally.

Coloration. Essentially as in male.

Measurements. Length of body 7.5 mm., of pronotum 3 mm., of tegmen 10.5 mm., of hind tibia 3.5 mm.; width of pronotum 3.2 mm.

In addition to the type and allotype, there are 2 male and 2 female paratypes. One female has 2 large spines on the ventro-anterior margin of each front femur; the second female has 1 spine on 1 femur and 2 on the other. A spread wing of 1 male paratype has about 14 areolets between the discoidal and median veins of the wing, and 1 female has about 18 areolets; the tegmen of the latter specimen measures 11.5 mm., and the supraanal plate is entire apically.

*Type locality.* Loma del Gato, Cobre Range, Oriente Province, Cuba.

*Type.* Museum of Comparative Zoölogy.

*Paratypes.* U. S. National Museum, No. 54827, and Museum of Comparative Zoölogy.

The holotype was collected at an elevation of about 3,000 feet, July 3-7, 1936. The allotype, one male paratype, and one female paratype bear the same data as the type. One male paratype is from the Gran Piedra Range (near Daiquiri), Oriente Province, 2,000-3,000 feet, May 30-31, 1936. One female paratype is from Buenos Aires, Trinidad Mts., Santa Clara Province, 2,500-3,500 feet, May 8-14, 1936. All the material was collected by P. J. Darlington. The two paratypes from the type locality are deposited in the U. S. National Museum.

### The Genus *NELIPOPHYGUS* Rehn and Hebard

*Nelipophygus* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, p. 122, 1927 (genotype, *N. ramsdeni* R. & H., by original designation and by monotypy).

The material collected by Dr. Darlington in Oriente Province of this unusual Cuban genus adds to our knowledge of the variation occurring in *ramsdeni* and includes a new species the characters of which necessitate two modifications in the original generic diagnosis. The tegmen of *banksi* is truncate and weakly concave and oblique at the apex (fig. 35), rather than arcuate-truncate with the greatest length on the inner margin as in *ramsdeni*. The arolia are small but distinct (fig. 36) instead of absent as in *ramsdeni*.

The close similarity of the two species in other important characters and in habitus, together with their occurrence in the same part of

Oriente Province, indicates clearly that they belong to the same natural group. Accordingly, the limits of *Nelipophygus* are modified to include *banksi*. In the key to West Indian genera of Pseudomopinae (Rehn and Hebard, 1927, pp. 5-7) *banksi* ends blindly near *Ischnoptera* and *Nelipophygus*, but the substitution of "Arolia absent or much reduced in size" for "Arolia absent" eliminates the difficulty. Neither species runs directly through couplet 1 of that key, since their vestigial wings do not provide the characters there required, but by elimination the student will recognize them as members of the group Ischnopterae and then arrive at *Nelipophygus* by the key characters.

#### NELIPOPHYGUS RAMSDENI Rehn and Hebard

*Nelipophygus ramsdeni* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1 pp. 123-126, pl. 9, figs. 8-13, pl. 10, figs. 1-3, 1927.

Material here recorded. 1 female, Upper Ovando River (the mouth of which is just south of Cape Maisi), Oriente Province, 1,000-2,000 feet, July 17-20, 1936 (P. J. Darlington) (M. C. Z.)

This specimen has been compared with the types at Philadelphia and found to differ from the female allotype in smaller size and a lighter shade of brown. These differences may represent individual variation or reflect the influence of environment. Measurements are as follows: Length of body 15 mm., of pronotum 5.25 mm., of tegmen 5.7 mm., of hind tibia 6.4 mm.; width of pronotum 6.6 mm., of tegmen 4.6 mm.

#### NELIPOPHYGUS BANKSI, new species

Figs. 34-37

This distinct species differs from *ramsdeni* in the small arolia, differently shaped tegmina, more expanded hind tibiae, less elongate projection on the posterior margin of metanotum, and in differences in the male subgenital plate.

*Male* (holotype). General body form as in *ramsdeni*; dorsal surface moderately shining. Interocular space much wider than distance between antennal sockets (as 10 to 6.6); antennae, eyes, and palpi as in *ramsdeni*. Pronotum with sides decurved hoodlike anteriorly, concealing head from above; a few punctations; shape as in *ramsdeni*. Tegmen (fig. 35) subquadrate, greatest length on costal margin; latero-posterior angle reaching midway on tergum 2; inner posterior angle falling short of posterior margin of metanotum; apical margin weakly oblique, slightly concave; venation as illustrated. Wing a vestigial pad, reaching to posterior margin of metanotum, concealed by tegmen

in dorsal view. Posterior margin of metanotum with blunt, obtuse-angled projection (not long and acutely spinelike as in *ramsdeni*.) Front and middle legs like those of *ramsdeni* except for presence of small arolia; ventral margins of hind femur with six to eight sturdy spurs; hind tibia noticeably more flattened and expanded than in *ramsdeni*, a broad, shallowly concave area on the surface of apical third adjoining external margin and extending two-thirds width of tibia, not grooved or so definitely limited in area as in certain species of *Eurycotis* (fig. 4); hind tarsus as in *ramsdeni* except for arolium (fig. 36). Abdomen shaped as in *ramsdeni*; posterior half of dorsal surface with conspicuous, recumbent, sparsely distributed setae; supraanal plate about as in *ramsdeni*, slightly emarginate apically; a left phallomere large, hooked, similar to that of *ramsdeni* (see Rehn and Hebard, l. c., pl. 10, fig. 1); a right phallomere sharp, elongate, spinelike, projecting. Subgenital plate (fig. 34) with right lateral portion abruptly curved dorsally in a nearly vertical plane; left lateral portion less abruptly curved dorsally; apical margin with narrow, ventrally decurved flap; disk of subgenital plate broadly concave in posterior half; styles borne near base of apical flap; left style slightly tapering, extending ventrad of plate apically; right style broadly ovate, extending about on plane with plate, a prominent oblique ridge on ventral surface. Cerci as in *ramsdeni*.

Coloration. General color dark brown, with reddish tinge; eyes black; general color of face and occiput light reddish brown, blotched with dark between antennal sockets; ocellar spots and clypeus pale; palpi pale brown; antenna brown, pale reddish at base; coxae blackish brown over most of areas receiving femora in repose; external lateral flanges of coxae noticeably paler; remainder of legs uniformly dark brown except arolia and bases of claws, which are pale. Supraanal plate uniformly dark brown; subgenital plate brown, apical flap pale; cercus brown, grading to pale in apical fifth.

Measurements. Length of body 15 mm., of pronotum 5.8 mm., of tegmen 4.3 mm., of hind tibia 5.8 mm.; width of pronotum 7.5 mm., of tegmen 4.7 mm.

*Female* (allotype). Differing from male as follows: Ventral margins of hind femur each with six spurs; supraanal plate (fig. 37) more produced posteriorly than in male; subgenital plate as in female of *ramsdeni*.

Coloration. Same in general as that of male; abdomen very dark on apical segments; cerci darker than in male, with only a trace of pale at apices.

Measurements. Length of body 16 mm., of pronotum 5.8 mm., of tegmen 4.8 mm., of hind tibia 5.6 mm.; width of pronotum 7.6 mm., of tegmen 4.8 mm.

There is one female paratype that agrees essentially with the allotype. The apex of the supraanal plate is shallowly and broadly emarginate. The apical segments of the abdomen are not so dark as in the allotype, and the middle region of tergum 7 is blotched with pale orange. One male nymph and one female nymph, measuring 13.5 mm. and 12 mm., respectively, in body length, are dark brown with legs paler. No wing or tegminal pads are present.

*Type locality.* Pico Turquino (south side), Oriente Province, Cuba.

*Type.* Museum of Comparative Zoölogy.

*Paratype.* U. S. National Museum, No. 54828.

The type, allotype, paratype, and two nymphs were all taken at type locality, 3,000–5,000 feet altitude, June 1936, by P. J. Darlington. The male nymph is deposited in the U. S. National Museum. The author is glad to name this species in honor of the veteran American entomologist, Nathan Banks, Curator of Entomology in the Museum of Comparative Zoölogy.

### The Genus SYMPLOCE Hebard

*Symploce* Hebard, Trans. Amer. Ent. Soc., vol. 42, p. 355, 1916 (genotype, *Ischnoptera capitata* Saussure, by original designation).

This genus contains many species in the warmer regions throughout the world, but the eight species now recognized as American are all found in the West Indies. One of these, *hospes* (Perkins), occurs on the American mainland and in Hawaii as well, but in America at present *Symploce* is essentially West Indian. The male genitalia furnish the most important specific characters, and illustrations of these structures, for the eight West Indian species, have been given by Hebard (1916b) and Rehn and Hebard (1927). A ninth species is now added, this from the seacoast of Oriente Province, Cuba. The only previously recorded Cuban species is the genotype, *capitata*, but it is less closely related to the new species than is *jamaicana* (Rehn).

### SYMPLOCE MUNDA, new species

Fig. 39

The male of this species differs from *jamaicana* in the structure of terga 1, 9, and 10, and that of the subgenital plate.

*Male* (holotype). Of average size for the genus; interocular space narrower than distance between antennal sockets (about as 2.45 to 3.6); segment 4 of maxillary palpus slightly shorter than apical segment. Pronotum, tegmina, and legs essentially as in *jamaicana*; ulnar vein of wing with two complete and two incomplete rami. Tergum 1 with dense tuft of hairs on posterior half, projecting forward, similar to that of *jamaicana*; sparse, slender hairs arranged in an oblique row on each side of middle near base poorly developed, not so prominent as in *jamaicana*. Tergum 9 unspecialized (in *jamaicana* there is a dorsally projecting lip, bearing a comb of sparse, erect hairs). Supraanal plate similar in general form to that of *jamaicana*, but strongly bilobed apically, unspecialized basally (the apex in *jamaicana* is entire, broadly rounded, with a prominent raised lip at the base of the disk corresponding to that of tergum 9). Subgenital plate (fig. 39) with left style heavily sclerotized, somewhat concave in basal two-thirds in ventral view, the lateral margin briefly recurved, apical third slender, twisted to the left, about five coarse teeth on ventral margin; large apical plate on right slightly convex in ventral view, a blunt apical tooth curving toward left, its margin minutely serrate; right latero-posterior angle of main body of subgenital plate with sparse, short, bristly setae (in *jamaicana* the left style is different, the large right plate has an acute hook directed to the left, and there is no cluster of bristly spines as in *munda*).

*Coloration*. General color pale yellowish; eyes dark brown; ocellar spots pinkish; antenna light brown, paler at base; wide lateral and narrow anterior borders of pronotum and marginal field of tegmen washed with whitish; legs pale, slightly darker on tibiae, tarsi, spines, and spurs; a conspicuous, small, black blotch at base of each coxa; abdominal sterna 2-6 with similar blotches at each side, a small black dot associated with each blotch laterally; terga 1-7 progressively darker toward apex of abdomen, the last very dark brown, all with pale margins; terga 8-10 pale yellowish, disk of 10 (supraanal plate) yellow; subgenital plate pale except for dark setae and left style; cerci pale dorsally, all except apical segments divided into dark-brown basal half and pale apical half ventrally, apical segments all dark ventrally.

*Measurements*. Length of body 9 mm., of pronotum 2.4 mm., of tegmen 10.5 mm., of hind tibia 3.75 mm.; width of pronotum 3.4 mm.

*Female* (allotype). General form as in male; width of interocular space considerably narrower than distance between antennal sockets (about as 3.45 to 4.6); ulnar vein of wing with three complete and

four incomplete rami; apex of supraanal plate with narrow, V-shaped incision; apex of subgenital plate shallowly and very broadly concave.

Coloration. Differing from male as follows: Terga 4-7 conspicuously darker, pale posterior margins poorly developed but pale lateral borders conspicuous; supraanal plate whitish yellow except a dark-brown blotch on disk each side of middle; subgenital plate with wide lateral and apical whitish-yellow border and a dark blotch and dot on each side as in preceding sterna; cercus uniformly blackish brown dorsally, same ventrally except that segments in basal two-thirds are somewhat pale in their apical portions.

Measurements. Length of body 10.5 mm., of pronotum 3.3 mm., of tegmen 13 mm., of hind tibia 5.2 mm.; width of pronotum 4.3 mm.

In addition to the type and allotype just described, there is one male paratype. It is smaller than the type and differs otherwise as follows: Width of interocular area in proportion to distance between antennal sockets as 2.9 to 3.4; ulnar vein of left and right wings with two incomplete and one incomplete rami, and one complete and one incomplete rami, respectively. Subgenital plate with left style more prolonged and conically tapering at apex, rather than twisted and flattened, without teeth; apical hook of large right plate less blunt than in type; group of spinelike setae constituting a much larger and denser cluster.

Measurements. Length of body 7.5 mm., of pronotum 2.3 mm., of tegmen 8.5 mm., of hind tibia 3.4 mm.; width of pronotum 2.9 mm.

*Type locality.* Coast below Pico Turquino, Oriente Province, Cuba.

*Type.* Museum of Comparative Zoölogy.

*Paratype.* U. S. National Museum, No. 54829.

The type and allotype were taken at the type locality, June 26-30, 1936, by P. J. Darlington. The paratype was collected by Dr. Darlington at Maisi, Oriente Province, July 17, 1936.

### Subfamily BLATTINAE

#### The Genus EURYCOTIS Stål

*Eurycotis* Stål, Bihang K. Svenska Vet. Akad. Handl., Bd. 2, No. 13, p. 13, 1874 (genotype by monotypy, *Polyzosteria rufovitata* Brunner).

*Eurycotis* is richly represented in Cuba, 16 of the 22 West Indian species being known from that island. Of these 22 species, 14 were first described by Rehn and Hebard (1927) or have since been discovered, indicating that others may yet remain unknown to science. The keys, descriptions, and illustrations by Rehn and Hebard, together with

those of the present paper, should permit the identification of most specimens, and a fuller treatment of the genus does not seem timely until it is possible to consider the species belonging to the North, Central, and South American faunas. Until that time, the limits of the genus must remain uncertain, as indicated by Rehn and Hebard (1. c.). The generic key of those authors and that of Shelford (1910) suffice for identification purposes. The former authors mention 4 apparently natural groups into which the West Indian species may be divided. Of the 16 Cuban species, all except 5 (*lacernata*, *rhodae*, *opaca*, *taurus*, *cribosa*) belong to the group of "species of glabrous or shining, almost impunctate surface, with tegmina lateral or quadrate, but not attinent, largely with variegated color pattern."

It should be noted that *Blatta guttata* Thunberg, described from St. Bartholomew, is possibly a species of *Eurycotis* (see Rehn and Hebard, 1. c., p. 159) and that *Periplaneta occidentalis* Sauss. has been removed from *Eurycotis*, where it was placed by Shelford (1910, p. 12), to *Pelmatosilpha* (see Rehn and Hebard, 1. c., p. 15).

*Key to the West Indian Species of Eurycotis*

1. Tegmina with inner margins attinent or overlapping. . . . . 2  
    Tegmina with inner margins well separated. . . . . 6
2. Entire dorsal surface of body and tegmina pitch black; male supraanal plate (fig. 18) with apical angles spiniform, recurved; female supraanal plate (fig. 17) transverse, broadly emarginate; spiniform postero-lateral production of tergum 7 with a lamella on inner side (fig. 2). (Cuba) . . . . . *taurus* Rehn and Hebard  
    Entire dorsal surface of body and tegmina not pitch black, if light areas of pronotum are indistinct (some specimens of *opaca*) the supraanal plate differing in each sex (fig. 14, 16) from above; spiniform process of tergum 7 without an inner lamella or (in *opaca*, fig. 5) with this poorly developed. . . . . 3
3. Body shining dark brown or black, pale lateral margins (fig. 1) extending onto base of tergum 6. (Cuba) . . . . . *rhodae*, new species  
    Body not colored as above. . . . . 4
4. Tegmina extending to tergum 1 or slightly beyond, as long as wide. . . . . 5  
    Tegmina not reaching tergum 1, much wider than long. (Thorax with orange lateral borders, sometimes poorly differentiated.) (See figs. 5, 14, 16) (Cuba and Isle of Pines) . . . . . *opaca* (Brunner)
5. Abdomen with a pale dorsal border extending along each lateral margin; tegmen subquadrate. (Virgin Islands) . . . . . *improcera* Rehn



- Abdomen without pale border along lateral margins; apex of tegmen oblique. (Antigua).....*similis* Caudell
6. Pronotum and dorsal surface of abdomen entirely dark. (In some species the hind tibia is expanded laterally about midway of its length, and with a conspicuous depression as in fig. 4.).....7  
Neither pronotum nor abdomen entirely dark.....10
7. Tegmen conspicuously yellow.....8  
Tegmen entirely dark.....9
8. Hind tibia expanded laterally and with a conspicuous depression similar to that of *tibialis* (fig. 4). (Cuba)<sup>1</sup>  
*flavipennis* Saussure and Zehntner  
Hind tibia not so specialized. (Apical abdominal terga closely and heavily punctate; first segment of tarsus with pulvillus three-fourths the ventral length of segment.) (Cuba)  
*cribosa* Rehn and Hebard
9. Male supraanal plate (fig. 10) well produced, though transverse; male tegmen (fig. 20) rounded at apex; hind tibia in each sex expanded laterally about midway of its length, and with a conspicuous depression (fig. 4). (Hispaniola).....*tibialis* Hebard  
Male supraanal plate (fig. 12) very decidedly transverse; male tegmen (fig. 15) acute at apex; hind tibia of female broad, but not specialized as above. (Hind tibia of male specialized.) (Jamaica)<sup>2</sup>.....*liza* Rehn
10. Pronotum uniformly pale (except for scattered dark flecks), no conspicuous dark pattern.....11  
Pronotum not uniformly pale.....14
11. Apical five terga of abdomen entirely dark in color.....12  
Apex of abdomen not entirely dark (tegmen subquadrate; supraanal plate transverse in male, bicolored). (Cuba)  
*galcoides* Rehn and Hebard
12. Exposed portion of tegmen clearly transverse; tegmina separated by less than the width of a tegmen. (Cuba).....*caraibea* (Bolivar)  
Exposed portion of tegmen lobiform, not transverse; area between tegmina usually wider than the width of a tegmen.....13
13. Abdominal terga 2-5 heavily marked with dark at their bases, the dark areas ending abruptly before reaching lateral margins and, at their farthest extension laterad, covering about three-fourths

<sup>1</sup> *E. flavipennis* S. & Z. is known only from the original description, and, following Rehn and Hebard (l. c., p. 179), the present interpretation of the unsatisfactory description had best be retained until further information is available.

<sup>2</sup> *E. liza* Rehn is based upon two specimens, male and female, taken at New York City on a banana ship from Jamaica. For this reason, Jamaica is considered the native home of *liza*.

- the length of segment, narrowed each side of median line. (Cuba).....*scalaris* Rehn and Hebard
- Abdominal terga 2-5 with narrow dark basal margins, these often indistinct. (Cuba).....*dimidiata* (Bolivar)
14. Pronotum with a definite dark design on the disk, such as in figs. 7-9.....16  
 Pronotum without definite design on disk such as above, but sometimes with pale lateral borders.....15
15. A dark species with a striking pale longitudinal band extending from head to middle of abdominal tergum 6 on each lateral margin, closely resembling *rhodae* (fig. 1) except that tegmina are lateral and widely separated; no transverse bars on abdomen. (Cuba).....*lacernata* Cabrera
- A dark species with lateral borders of pronotum mars orange, this coloring not extending onto metanotum or abdomen; terga 2-7 with narrow basal transverse bars of mikado brown. (Hispaniola).....*histrion* Rehn
16. Head with a transverse, dark interocular bar (fig. 19), not with a triangular point extending ventrally to level of antennal bases or onto face.....17  
 Head with a dark interocular marking extending triangularly to level of antennal bases (fig. 21) or onto face.....20
17. Dorsal surface of abdomen entirely dark except for lateral maculations on terga 2-6, no transverse bars; basal segment of hind tarsus with pulvillus about two-thirds as long as segment. (Bahamas).....*bahamensis* Rehn
- Dorsal surface of abdomen marked with transverse bars; basal segment of hind tarsus with pulvillus not over one-half as long as segment.....18
18. Abdominal tergum 6 and supraanal plate uniformly dark; tegmen subquadrate, the nearly straight inner margin angulate with apical margin. (Cuba).....*balteata* Cabrera
- Tergum 6 not entirely dark, supraanal plate often reddish brown or pale on apical two-thirds; tegmen not subquadrate, inner and apical margins continuous instead of angulate.....19
19. Tegmen narrowly lobiform (fig. 8); pronotum with paired dark crescent-shaped marks. (Cuba).....*fugacis*, new species
- Tegmen broadly lobiform, shaped much like tegmen of *caudellana* (fig. 9); pronotal pattern horseshoe shaped, with inner margins of dark design irregular. (Cuba)  
*ferrum-equinum* Rehn and Hebard

20. Abdominal terga 1-5 transversely bordered with dark both anteriorly and posteriorly, the dark bars united before reaching lateral margins, a large pale submarginal maculation on each lateral border of terga 2-5 (fig. 9); dark posterior border of pronotum joined to dark blotches on disk. (Cuba)

*caudellana*, new species

Abdomen not marked as above; dark posterior border of pronotum, if developed, not joined to dark blotches on disk. . . . . 21

21. Tegmen subquadrate; dark interocular marking extending ventrally to a level with ventral margin of antennal sockets, sides of triangular marking irregular. (Cuba)

*torquincensis* Rehn and Hebard

Tegmen lobiform (fig. 7); dark interocular marking with apex not extending ventrally beyond level of dorsal margins of antennal sockets, sides of triangular marking smooth. (Cuba)

*famelica*, new species

#### EURYCOTIS RHODAE, new species

##### Fig. 1

This species is closely related to *lacernata*, which apparently replaces *rhodae* in western Cuba. The coloration of *rhodae* is so striking that the general appearance distinguishes it from all other known species. From *lacernata* it differs in the considerably larger size, in the exposed portions of the tegmina being transverse and slightly overlapping instead of lateral, and shaped much as in *caudellana* (fig. 9), in the lateral margins of the female supraanal plate converging less posteriorly, and in the color of the ventral surface of the abdomen, in addition to the more minor features noted below.

*Female* (holotype). Body smooth, shining; tegmina weakly impunctate. Head in frontal view slightly longer than wide, a little longer proportionately than in a female paratype of *lacernata*: interocular space noticeably wider than distance between antennal sockets. Anterior margin of pronotum briefly truncate directly above occiput, latero-anterior angles broadly rounded and depressed hoodlike about eyes. Tegmina subquadrate, exposed portions transverse, overlapping, extending posteriorly about one-fourth to one-third length of metanotum. Legs essentially as in *lacernata*; hind tibia moderately inflated, slightly less so than in *lacernata*, surface smooth; pulvillus of basal segment of hind tarsus less than one-fourth as long as segment. Abdomen with latero-posterior angles of terga 2-7 acute, those of tergum

7 very prolonged, with no inner lamella such as in *taurus* and *opaca* (figs. 2, 5); abdominal sterna similar to those of *lacernata*; supraanal plate wider at base than long, sides less converging than in *lacernata*, and latero-posterior angles well rounded in contrast to abruptly right-angled or slightly acute-angled as in *lacernata*; apical emargination broadly obtuse-angulate. Cerci slender, acuminate (right cercus with apex deformed).

Coloration. Pronotum with disk black, on posterior half an indistinct V-shaped mark of reddish brown with apex pointing forward and sides closely appressed, also a few dots of the same color showing through ground color of black; broad lateral borders of yellow as in fig. 1; margins dark brown, progressively intense anteriorly along lateral margins. Head with interocular area of dark brown, extending further posteriorly than in *lacernata*, reaching well onto occiput; a brownish transverse band connecting ventral margins of antennal sockets and joined with subquadrate ventral extension of interocular marking; region of fronto-clypeal suture pale brown, darker at frontal pits, joined to transverse facial band by a narrow longitudinal stripe, a single large brown dot on each side of median stripe at ventral margin of transverse band. (See Rehn and Hebard, 1927, pl. 12, fig. 7, for head coloration of *lacernata*.) Eyes dark; antennae pale brown. Tegmen brownish black, on inner five-eighths tinged with reddish, especially on inner posterior region; lateral border yellow, edged laterally with brown. Legs generally pale; lineate area at base of each coxa, dorsal margin of each femur, especially the ventral margins of hind femur in apical half, inner margin of middle tibia, spines, apices of claws, and apical portions of tarsal segments varying shades of brown; posterior tibia and tarsus dark brown, arolium, pulvilli, and base of claws paler. Dorsum of abdomen glossy black; four spots of reddish brown indicated on metanotum; posterior margin of terga reddish brown in reflected light; apical portion of supraanal plate and cerci reddish brown, apex of cercus pale; a broad yellow lateral border on terga 2-5 and at base of tergum 6, this pale border having a somewhat narrower counterpart on ventral surface of abdomen, which otherwise is uniformly black. (The venter of the female paratype of *lacernata* is light reddish brown, with a pale border.)

Measurements. Length of body 29 mm., of pronotum 7.8 mm., of tegmen 4.5 mm., of hind tibia 11.5 mm.; width of pronotum 11.5 mm., of tegmen 7.5 mm.

*Type locality.* Pico Turquino (south side), Oriente Province, Cuba.

*Type.* Museum of Comparative Zoölogy.

The only known specimen, the female type, was collected by P. J. Darlington in June 1936, at an altitude of 3,000–5,000 feet. This attractive species is named in honor of Mrs. Rhoda Frank Mislove, of the U. S. National Museum, who has assisted the writer in the preparation of many Orthoptera for study.

EURYCOTIS TORQUINENSIS Rehn and Hebard

Figs. 6, 11

*Eurycotis torquinensis* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, pp. 163–165, pl. 12, figs. 9–12.

Material here recorded. 1 male, 8 females, 3 nymphal females, Pico Turquino (south side), Oriente Province, 3,000–5,000 feet, June 1936; 1 female, 2 nymphal females, same data except altitude, 5,000–6,000 feet (P. J. Darlington) (M. C. Z. and U. S. N. M.).

The above male has been compared with the only previously known specimen, the male holotype, and found to agree except in features ascribable to individual variation. In two specimens the pronotal marking agrees with that of the holotype, but the two dark lanceolate blotches of the disk are connected anteriorly by a short transverse bar in the other specimens. The middle area of tergum 7 has a pale-brown blotch in four specimens. In the female taken at 5,000–6,000 feet the dark area of the face is connected with the fronto-clypeal bar; the head coloration of the other specimens is about as figured by Rehn and Hebard (1. c., pl. 12, fig. 10). The venter of the abdomen is variable in color. The sterna of the male are dark brown except for pale lateral borders on all except the subgenital plate and penultimate sternum, the pale borders extending a short way along the posterior margins. The venter of the female varies from entirely pale except for the subgenital plate and penultimate sternum, which are brown, to a condition in which all sterna are considerably marked with dark brown. The basal sterna may be pale, with a small dark blotch on each lateral border. The penultimate sternum of most specimens is chestnut brown, marked with adjoining irregular, blackish-brown and pale bars on each lateral border. Rehn and Hebard (1. c., p. 170) have described similar variation in the coloration of the venter of *ferrum-equinum*. Females agree with the male in the essential details of tegmina, interocular width, legs, and other features. The female subgenital plate is typical of this section of the genus, and the supraanal plate (fig. 16) is as illustrated. The specimen from the 5,000–6,000 foot level is smaller than the others. Measurements in millimeters of

this and those of an average female from the 3,000-5,000 foot level are as follows: Length of body 18.5, 22; of pronotum 6.1, 6.9; of tegmen 2.4, 3.3; of hind tibia 8, 9; width of pronotum 8.4, 10. The nymphs range from 12 to 19 mm. in length. A pale border surrounds the pronotum anteriorly and laterally and extends back to the apex of tergum 5. The hind tibiae and tarsi are dark brown.

EURYCOTIS FAMELICA, new species

Figs. 7, 21

This new species is a close relative of *balteata* but differs from that species in several distinctive color features and in slight, but none the less evident, structural features in tegminal shape.

*Female* (holotype). Size medium for genus; body very smooth and shiny. Head about as wide as long in frontal view (fig. 21). Hind tibia noticeably swollen, not flattened as in *ferrum-equinum* but agreeing essentially with *balteata* (see Rehn and Hebard, 1. c., p. 166, pl. 12, fig. 14) except that it is more narrowed near base than there figured. Front and middle tibiae slightly swollen. Pulvillus of basal segment of hind tarsus one-fifth the ventral length of segment. Nota and abdominal segments typical of this section of the genus. Tegmen obtuse-angulate at junction of inner and apical margins. Supraanal plate about as described in *caudellana*. Subgenital plate and cerci as in that species.

*Coloration*. Head with irregularly margined, triangular, interocular marking of dark brown as illustrated (fig. 21); face and clypeus weakly marked with pale brown. Pronotal markings brownish black, the margins reddish brown. Legs nearly uniformly pale except for brown spines; middle and hind coxae each with a moderately weak, oblique brown line near base; dorsal margins of middle and hind femora, apex and base of hind tibia, and hind tarsus washed with pale brown. Tegmen with inner margin bordered with brown. Markings of terga 1-9 blackish tinged with reddish, especially along margins. Supraanal plate reddish brown, darker at base; cerci brown. Abdominal sterna brown, a wide lateral pale border on segments 2-6.

*Measurements*. Length of body 23 mm., of pronotum 6.5 mm., of tegmen 3 mm., of hind tibia 9.5 mm.; width of pronotum 10.3 mm.

*Type locality*. Loma del Gato, Cobre Range, Oriente Province, Cuba.

*Type*. Museum of Comparative Zoölogy.

The type female was taken July 3-7, 1936, by P. J. Darlington at an altitude of about 3,000 feet. In addition to the type, there is a nymphal

male 12 mm. long with the same data. The dorsal surface of the body is dark brown, a continuous pale border including the cerci. The posterior half of the pronotal disk and middle areas of the meso- and metanotum are of a lighter shade of brown than the general ground color.

#### EURYCOTIS FUGACIS, new species

Figs. 3, 8, 13, 19

This species is related to *balteata*, from which it differs in the shape of the tegmina and the inflation of the hind tibiae in both sexes, and in the shape of the male supraanal plate. The male genitalia of *balteata* have not been compared with those of *fugacis*, but differences probably occur. The most conspicuous difference in coloration is found on the pronotum. In *fugacis* (fig. 8) there are two curved marks roughly resembling parentheses, while *balteata* (see Rehn and Hebard, 1. c., pl. 13, fig. 1) has two broad lanceolate blotches. Tergum 6 of *fugacis* is not entirely dark, the tegmen has a border of brown along the inner margin, the anterior margin of the metanotum is pale, and the venter of the abdomen is pale except for the subgenital plate and the middle portions of the four sterna preceding it (sternum 8 all dark in male). In contrast, tergum 6 of *balteata* is entirely dark, the tegmen is merely margined with brown, the anterior margin of the metanotum has a large dark spot at each side near the meso-posterior portion of the corresponding tegmen, and the venter of the abdomen is solidly dark except that the five basal sterna have lateral yellow spots.

*Male* (holotype). General form as in female (fig. 3); head relatively broad, about as wide as long (fig. 19). Tegmen narrowly lobiform as in female. Hind tibia flattened, similar to that of *ferrum-equinum*. Pulvillus of basal segment of hind tarsus nearly one-half ventral length of segment. Supraanal plate (abnormal, owing to injury) (fig. 13) transverse, broadly bilobed apically. Subgenital plate (also abnormal) transverse, apparently typical for this section of the genus. Left phallomere of concealed genitalia similar to that of *torquinensis* (Rehn and Hebard, 1. c., pl. 12, fig. 11), flattened, slender, recurved at apex; no such hook present as in *torquinensis* just dorsad of subgenital plate on right side (1. c., pl. 12, fig. 12), but that sclerite simple; a complicated right phallomere (fig. 3) in form of a lamellate triangular hook with an associated, rather convex, recurved plate at base, this phallomere differing from the corresponding structure in *torquinensis* (fig. 6).

Coloration. Head with interocular bar of blackish brown (fig. 19); region between antennal sockets and along fronto-clypeal suture tinged

with pale brown; eyes black. Dorsal body and tegminal markings of blackish brown on yellow ground color as in female (fig. 8) except as noted; each parenthesis-shaped mark on disk of pronotum interrupted with pale brown one-third distance from anterior extremity; dark posterior borders of mesonotum, metanotum, and abdominal terga rather more intense in coloration; tergum 7 with narrow pale anterior border. Hind tibia brown, paler near spurs; hind tarsus washed with brown, darkest near apices of segments; each coxa marked with brownish black near base; margins of hind femur and spurs brown; the other leg structures pale. Subgenital plate and penultimate sternum brown; sterna 6 and 7 with middle area brown, with pale lateral borders; other sterna pale except for brown posterior and lateral margins. Supraanal plate blackish brown, blotched transversely across middle with reddish brown. Cercus dark brown above, more reddish in basal half, and with a subapical pale spot, ventral surface similar.

Measurements. Length of body 21 mm., of pronotum 6.5 mm., of tegmen 2.8 mm., of hind tibia 8 mm.; width of pronotum 9.8 mm.

*Female* (allotype). Agreeing with male in all important features except as noted. Interocular area slightly wider than in male. Supraanal plate as illustrated (fig. 8), apical margin (slightly asymmetrical as result of injury) sharply emarginate. Subgenital plate like those of related species, obtuse-angulate in lateral view.

Coloration. General color of body markings reddish brown. Parenthesis-shaped marks on pronotum not interrupted. Tergum 7 pale anteriorly only near lateral borders (probably with continuous anterior border when segments are more fully extended). Hind tibia with pale longitudinal stripe occupying lateral half of each side next to external margin, remainder pale brown. Penultimate sternum pale anteriorly on lateral border.

Measurements. Length of body 23 mm., of pronotum 6.7 mm., of tegmen 3 mm., of hind tibia 8.5 mm.; width of pronotum 10 mm.

*Type locality.* Buenos Aires, Trinidad Mts., Santa Clara Province, Cuba.

*Type.* Museum of Comparative Zoölogy.

The type and allotype were taken at an altitude of 2,500–3,500 feet, at the type locality, May 8–14, 1936, by P. J. Darlington.

#### EURYCOTIS FERRUM-EQUINUM Rehn and Hebard

*Eurycotis ferrum-equinum* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, pp. 168–171, pl. 13, figs. 2–5.

*Material here recorded.* 1 female, 1 nymphal female, mountains



north of Imias, Oriente Province, 3,000–4,000 feet, July 25–28, 1936 (P. J. Darlington) (M. C. Z.).

Identification of the somewhat teneral adult has been confirmed by comparison with the types. The nymph, 10 mm. long, is pale at the apex of the abdomen, and the terga are obliquely pale bordered along the lateral margins. The thorax is bordered in a manner typical of the nymphs of this section of *Eurycotis*.

EURYCOTIS CAUDELLANA, new species

Fig. 9

The color pattern of *caudellana* is very distinctive, and the species should be identifiable by the foregoing key without difficulty; no other species closely resembles it. *Eurycotis scalaris* of eastern Cuba is suggestive of *caudellana* in the markings of the abdomen, but differs in other color features and in the shape of the tegmina.

*Female* (holotype). Medium to small for the genus; smooth and shining. Head in frontal view rather sharply triangular; interocular area but little wider than distance between antennal sockets. Hind tibia strongly inflated; pronotum and other legs typical of related species; pulvillus of basal segment of hind tarsus occupying no more than apical fourth of segment. Tegmen lateral, broadly rounded inner and apical margins without sign of angulation. Latero-posterior angles of abdominal terga about as in *rhodae*; supraanal plate with sides rather straight in apical two-thirds and converging strongly; apical angles slightly acute; apical emargination evenly and deeply rounded. Abdominal sterna typical of related species; subgenital plate obtuse-angulate in lateral view; cercus moderately broad, acuminate.

*Coloration*. Head generally pale; eyes black; interocular area dark brown, posterior margin irregularly excavate, ventral margin roughly triangular, extending to level of an imaginary line connecting middle of antennal sockets; slightly darker on clypeus and labrum; antenna light brown, pale at base. Pronotum marked with black as illustrated in fig. 9; two pale-brown dots on posterior half of disk; a wide lateral border of yellow; dark-brown lateral and apical margins. Meso- and metanotum and tegmina marked with dark reddish brown as illustrated. Legs generally pale; middle and hind femora each with oblique bar of dark brown basally; margins of middle and hind femora, all spines, apical and basal portions of hind tibia, and most of hind tarsus except pulvilli light brown. Terga yellow, marked with black tinged with reddish as illustrated; lateral margins brown; supraanal plate brownish toward apex; cercus reddish brown, darker along margins;

sterna brown, the posterior segments with pale lateral borders; subgenital plate somewhat darker at apex.

Measurements. Length of body (abdomen loosely attached) 21 mm., of pronotum 6 mm., of tegmen 2.4 mm., of hind tibia 12 mm.; width of pronotum 13.2 mm.

*Type locality.* Rio de Auras (about 65 miles southwest of Cardenas), near Union de Reyes, Matanzas Province, Cuba.

*Type.* U. S. National Museum, No. 54328.

The female holotype is the only known specimen.

Probably no entomologist more conscientiously devoted a large part of his life to a study of the literature of his favorite group of insects than did the late Andrew Nelson Caudell during the 35 years that Orthoptera and the literature concerning them were both his joy and his life work. Not privileged to know him personally, the writer appreciates Mr. Caudell's contributions, especially through the good fortune of having daily contact with the literature reference catalogue prepared by him. The present species is named *caudellana* in respect for his memory.

#### EURYCOTIS CARAIBEA (Bolivar)

*Polyzosteria caraibea* Bolívar, Mém. Soc. Zool. France, vol. 1, p. 126, 1888.

*Material here recorded.* 1 male, Upper Ovando River, Oriente Province, 1,000–2,000 feet, July 17–20, 1936; 1 male, mountains north of Imias, Oriente Province, 3,000–4,000 feet, July 25–28, 1936 (P. J. Darlington); 1 male, introduced at Brainerd, Minn., July 1921. (M. C. Z. and U. S. N. M.)

Rehn and Hebard (1927, p. 178, pl. 14, figs. 3, 4) have given descriptive notes on this species. In the original description, based on a male, Bolivar gave the following length measurements: Body 21 mm., pronotum 7.5 mm., tegmen 3 mm. In the above three specimens the pronotum is 7.5 to 8 mm. long and the body length is 24, 24, and 30 mm., respectively, owing to different degrees of body extension. The Monte Libano male recorded by Rehn and Hebard has been examined; the genitalia agree with those of the specimens here recorded. The phallomeres include several genital hooks none of which resembles the right hooks of *fugacis* and *torquinensis* (figs. 3, 6).

#### EURYCOTIS TAURUS Rehn and Hebard

Figs. 2, 17, 18

*Eurycotis taurus* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, pp. 182–185, pl. 14, figs. 5–8, 1927.

*Material here recorded.* 1 female, Coast below Pico Turquino, Oriente Province, June 26-30, 1936 (P. J. Darlington) (M. C. Z.).

Because of its size and pitch-black color, in addition to the distinctive features illustrated, this large species is not likely to be confused with any other. In the above-mentioned specimen there is a small, conspicuous spot of orange at each latero-anterior angle of the subgenital plate. Other features agree with the original description. Comparison with the type, allotype, and two paratypes has been made.

### Subfamily EPILAMPRINAE

#### The Genus AUDREIA Shelford

*Audreia* Shelford, Gen. Insect., Fasc. 101, p. 11, 1910 (genotype, *Calolampra carinulata* Saussure, designated by Hebard, 1920, p. 92).

In addition to the two Cuban species separated in the following key, *Audreia* contains *jamaicana* R. & H., several species from the mainland of tropical America, and several Old World species that have been referred to this genus.

#### Key to the Cuban Species of *Audreia*

Tegmina attingent or slightly overlapping; each tegmen subquadrate, posterior margin oblique and usually concave; posterior margin of pronotum very broadly and obtusely angulate in middle

*hamiltoni* (Rehn)

Tegmina lateral; each tegmen (figs. 41, 43) lobate; posterior margin of pronotum truncate. . . . . *exploratrix*, new species

#### AUDREIA HAMILTONI (Rehn)

*Calolampra hamiltoni* Rehn, Trans. Amer. Ent. Soc., vol. 29, pp. 274-275, 1903.

*Material here recorded.* 1 male, 6 females, 4 nymphs, Pico Turquino (south side), Oriente Province, 3,000-5,000 feet, June 1936; 1 nymph, same, 5,000-6,000 feet, June 1936 (P. J. Darlington) (M. C. Z. and U. S. N. M.).

The above male agrees in general with that described by Rehn and Hebard (1927, p. 205, pl. 15), but the pronotal disk is shining black and no lyrate marking is evident. Projecting near the right style is a phallomere, long, flattened, hooked like a shepherd crook apically, the very tip curved laterally; about 20 minute lateral bristles basad of hooked portion.

Measurements. Length of body 16.5 mm., of pronotum 5.5 mm., of tegmen 5 mm., of hind tibia 6.7 mm.; width of pronotum 8 mm., of tegmen 5.5 mm.

The posterior margin of the pronotum varies from slightly to markedly concave in the females. The pronotal disk is very dark in all but one, which has the lyrate pattern well developed. Body length ranges from 19.5 to 23 mm. The nymphs range from 9 to 17 mm. in body length, and the pronotum has the dark disk and paler lateral borders characteristic of the species.

#### AUDREIA EXPLORATRIX, new species

Figs. 41-43

This is a close relative of *hamiltoni*, differing from that species in the color of the interocular and interocellar areas, in addition to the features mentioned in the key.

*Male* (holotype). Interocular area wider than distance between antennal sockets (as 4.7 to 4), slightly wider proportionately than in male of *hamiltoni*. Segments of maxillary palpus short; apical segment slightly less than twice as long as greatest width, length about equal to segment 3, slightly less than segment 4. Pronotum in cross section vaulted and domelike, somewhat as in *hamiltoni*, dorsal outline as in fig. 43; a shallow, transverse depression, about as long as distance between tegmina, on disk just in front of posterior margin of pronotum; the whole sparsely punctate. Tegmen as in fig. 43 in dorsal view, in dorso-lateral view inner-apical margin nearly straight-oblique, costal margin gently convex, venation about as in female paratype (fig. 41); wing vestigial, reaching nearly to apex of tegmen. Legs as in *hamiltoni*. Terga 2-7 with latero-posterior angles not spined, but rounded or subrectangular; longitudinal weltlike ridges present. Supraanal plate bilobed, moderately emarginate. Subgenital plate (fig. 42) asymmetrical, the styles slender and delicate, the left style not located so near apex of plate as in *hamiltoni* but this difference perhaps due to individual variation.

Coloration. General color dark brown, with areas of lighter color and mottling typical of this section of *Audreia*. Head in frontal view black from postclypeus to an imaginary transverse line bisecting interocular area (in *hamiltoni* the black color of face extending dorsally only slightly onto interocular area); occiput with light mottling, blotched with dark brown at base; eyes grayish black; cheeks pale brown; labrum and anteclypeus yellow; each ocellar spot and narrow

stripe extending to eye and thence along inner margin of eye to occiput pale; maxillary palpus brown, darker on segment 5; antenna brown, segment 2 paler. Pronotum with disk blackish brown, faintly tinged with red; a trace of lyrate marking in a dark longitudinal median mark on anterior half of disk; borders of yellowish orange, heavily spotted with dark brown.

Tegmen dark brown on inner two-thirds of basal half, reddish orange on narrow inner border and on inner portion of apical half, border along costal margin yellowish; the light areas with small dark blotches. Each coxa pale, dark brown at base, the surface receiving femur in repose darkly punctate; front femur nearly all brown, faces paler; middle and hind femora yellow, external margins, indefinite longitudinal facial stripes, and sockets of spurs on inner margins dark brown; front tibia mostly brown, blotched with pale near apex; middle and hind tibiae with brown and pale longitudinal streaks, darkest at bases of spurs; front tarsus mostly brown, pulvilli and bases of segments 1 and 5 pale; middle and hind tarsi mostly pale, dark in apical portions of segments, especially on lateral surfaces.

Dorsal surface of abdomen mottled much as in *hamiltoni*, but somewhat darker, pale areas more conspicuous toward apex; basal half of supraanal plate dark brown, a pale area in middle at base, apical half pale brown, sparse dark punctations; venter of abdomen uniformly very dark, shining brownish black; subgenital plate narrowly margined with light brown apically, styles pale. Dorsal surface of cercus brownish, pale at base; ventral surface brownish, apex darker.

Measurements. Length of body 18 mm., of pronotum 5 mm., of tegmen 3.6 mm., of hind tibia 5 mm.; width of pronotum 7.1 mm.

*Female* (allotype). Differing essentially from male as noted. Ratio of interocular area to distance between antennal sockets 5.6 to 4.5; pronotum with a broad, shallow depression on posterior half of disk; costal margin of tegmen less convex, only slightly convex in dorso-lateral view; terga 2-7 with latero-posterior angles acute to spined, spines best developed on 5-7; supraanal plate more broadly rounded, weakly emarginate apically; subgenital plate evenly rounded apically, each lateral margin broadly concavo-emarginate opposite cercus as in *hamiltoni*.

Coloration. Much as in male, but considerably darker on dorsal surface of pronotum and tegmina; disk of pronotum with lighter borders reduced in size; tegmen blackish brown except basal three-fourths of costal margin, which is yellowish orange with sparse dark spots; tibiae and tarsi somewhat darker than in male; coxae, femora, and dor-

sum of abdomen about as in male; supraanal plate with a dark-brown elongate blotch in middle of basal half; lateral portions of basal half pale, with dark spots; apical half darker; subgenital plate uniformly dark; cercus dark brown, dorsal surface pale at base.

Measurements. Length of body 18 mm., of pronotum 5.7 mm., of tegmen 4.5 mm., of hind tibia 5.5 mm.; width of pronotum 8.5 mm.

There is one female paratype which agrees essentially with the allotype. The costal margin of the tegmen (fig. 41) is barely concave when seen in dorso-lateral view. The tegmen is colored about as in the male, the dorsum of the abdomen is rather darker than in the allotype, and the supraanal plate is all dark brown except for a few weakly developed orange spots at the base. The abdominal segments are more extended than in the allotype. Measurements. Length of body 23 mm., of pronotum 6.5 mm., of tegmen 5 mm., of hind tibia 7 mm.; width of pronotum 9 mm.

*Type locality.* Buenos Aires, Trinidad Mts., Santa Clara Province, Cuba.

*Type.* Museum of Comparative Zoölogy.

*Paratype.* U. S. National Museum, No. 54830.

The type, allotype, and paratype were taken at the type locality, 2,500-3,500 feet, May 8-14, 1936, by P. J. Darlington.

#### The Genus *EPILAMPRA* Burmeister

*Epilampra* Burmeister, Handb. Ent., Bd. 2, Abt. 2 (1st half), p. 504, 1838  
(genotype, *Blatta brasiliensis* Fabricius, designated by Kirby, 1903, p. 276).

There is considerable confusion in the literature concerning the genotype of *Epilampra* and its identity. Kirby's designation of *brasiliensis* appeared in August 1903, and in the same paper he designated *Epilampra nebulosa* Burm. as type of a new genus, *Pseudophoraspis*. In the following month Rehn (1903, p. 271) designated *nebulosa* as type of *Epilampra*. Kirby's action has priority. In his 1904 catalogue, however, Kirby gave *Blatta maculicollis* Serv. as type of *Epilampra*, placing *brasiliensis* as treated by Brunner (1865) and Burmeister (1838) in synonymy (the latter with a query), under the belief that the species called *brasiliensis* F. by Burmeister was misidentified. Shelford (1906, p. 276) has compared drawings in the Hope Museum at Oxford, prepared from Serville's specimens of *maculicollis* by Westwood, with Fabricius' type of *brasiliensis* in the Banksian cabinet of the British Museum, and he considers the two species distinct. Regardless of misidentification by Burmeister, which remains uncertain, the actual

*brasiliensis* of Fabricius is the genotype of *Epilampra* by Kirby's 1903 designation.

As pointed out by Hebard (1920) and Rehn and Hebard (1927), the limits of *Epilampra* and *Audreia* are poorly known and need thorough revision. Until that is done, the generic placement of *E. cubensis* Bol. is uncertain, and for the present this species is left in its original genus.

The present collection contains four of the five known Cuban species of *Epilampra*. Because of the comprehensive manner in which the group has been dealt with by Rehn and Hebard no key is presented here.

#### EPILAMPRA CUBENSIS Bolivar

##### Fig. 40

*Epilampra cubensis* Bolivar, Mém. Soc. Zool. France, vol. 1, p. 127, 1888.

*Material here recorded.* 1 female, Cuchillo de Guajimero (near Imias), Oriente Province, about 2,000 feet, July 25, 1936 (P. J. Darlington) (M. C. Z.).

This specimen is somewhat longer than indicated in Bolivar's description but otherwise agrees essentially. The general form is robust and suggestive of species of *Pelmatosilpha* though definitely epilamprine in its characters.

Gundlach (1890-91, p. 308) says that material of *cubensis* (very likely Bolivar's type material) came from Mata (about 10 miles south-east of Baracoa, Oriente Province).

*Female.* Head in frontal view as broad as long; width of interocular space and distance between antennal sockets subequal; face well filled, convex, with a weak, irregular, transverse depression between ventral margins of ocellar spots; apical segment of maxillary palpus with ventral margin broadly convex, length compared to segments 4 and 3 as 5 to 4 to 4; antenna normal for genus.

Pronotum not quite concealing occiput in dorsal view; point of greatest width near latero-posterior angles; posterior margin broadly and very obtusely angulate, barely concave on each side between middle and a point opposite anal sulcus of tegmen; dorsal surface smooth, moderately shining; disk with small depression on each side of middle corresponding to part of obscure lyrate pattern; front margin very narrowly marginate, gradually more widely so to latero-posterior angles, narrowed near base of costal margin of tegmen, then gradually widening again to middle of posterior margin. Tegmen (fig. 40) with venation as illustrated, marginate along costal margin, reaching about

to tergum 4. Wing poorly developed, reaching onto basal part of tergum 3, entirely covered by tegmen; venation well formed but wing probably non-functional, about 9 rami of ulnar vein visible. Legs typically epilamprine; middle region of front ventral margin of front femur with 4 subequal sturdy spines followed by about 12 tiny setalike spines and 2 genicular spurs; basal segment of hind tarsus longer than remaining segments; tarsal claws unspecialized; arolium of moderate size. Dorsal surface of abdomen flattened, shining; longitudinal welt-like ridges poorly developed but evident; latero-posterior angles of tergum 2 about right-angled; angles of terga 3-7 more acute, becoming sharply spiniform; supraanal plate deeply incised, broadly bilobed; cercus fairly slender, gradually tapering in apical half, acute at tip; sub-genital plate unspecialized, evenly rounded apically, each side broadly concave near base of cercus.

Coloration. Interocular space blackish brown, grading to dark chestnut on posterior part of occiput; blackish brown on face and postclypeus; a small chestnut blotch on front between ocellar spots; anteclypeus, labrum, most of mandibles, ocellar spots, margins of eyes, and area connecting each ocellar spot with corresponding eye pale; cheeks fuscous; eyes grayish black; maxillary palpus light brown, apical segment darker. Pronotum chestnut, slightly darker on posterior border; a few dark-brown spots on disk representing lyrate pattern. Tegmen chestnut; scapular and marginal fields lighter, mottled with rust-colored spots; a short black line in depression laterad of base of anal sulcus ("vena anali linea nigra apposita"—Bolivar).

Front coxa mostly pale, darker at base and on dorsal portion of surface receiving femur in repose; middle and hind coxae each averaging darker, punctate with black on surface receiving femur; front leg beyond coxa mostly fuscous, with pale streaks; middle and hind femora mostly yellowish, streaked with fuscous; middle tibia streaked with fuscous and yellowish, darker at bases of spurs; hind tibia very dark brown, spurs lighter; middle and hind tarsi mostly light fuscous, the basal segment of hind tarsus especially dark. Dorsum of abdomen brownish black, tinged with chestnut along lateral margins and on basal half of supraanal plate. Cercus pale, darker at apex. Venter of abdomen brownish black, the segments slightly margined laterally with chestnut and (in reflected light) with traces of paler posterior margins; subgenital plate dark, with lateral margins, a weak apical margin, and a small spot each side of middle on apical half light chestnut.



Measurements. Length of body 23 mm., of pronotum 7.4 mm., of tegmen 11 mm., of hind tibia 8.5 mm.; width of pronotum 9.6 mm., of tegmen 6.7 mm.

#### EPILAMPRA TAINANA Rehn and Hebard

*Epilampra tainana* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, pp. 213-216, pl. 16, figs. 9-11, 1927.

*Material here recorded.* 1 male, mountains north of Imias, Oriente Province, 3,000-4,000 feet, July 25-28, 1936 (P. J. Darlington) (M. C. Z.).

The male has previously been unknown, and the dorsal surface of this specimen is of a lighter color than the type series, and the abdomen is darker beneath, but agrees essentially in facial pattern and other features.

*Male.* Interocular area subequal to distance between ocellar spots and considerably narrower than distance between antennal sockets (as 2.4 to 3.4); apical segment of maxillary palpus three times as long as wide, noticeably longer than segment 4; supraanal plate extending well beyond subgenital plate, rather deeply incised and prominently bilobed apically; subgenital plate asymmetrical, a shallow concavity on apical margin to the left of middle, margin sinuate on right side posterior to right style.

Measurements. Length of body 18 mm., of pronotum 5.5 mm., of tegmen 20 mm., of hind tibia 7 mm.; width of pronotum 6.8 mm.

#### EPILAMPRA GUNDLACHI Rehn and Hebard

*Epilampra gundlachi* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, pp. 223-225, pl. 17, figs. 4 and 5, pl. 18, figs. 1 and 2, 1927.

*Material here recorded.* 1 male, 2 females, mountains north of Imias, Oriente Province, 3,000-4,000 feet, July 25-28, 1936; 1 female, Gran Piedra Range (north of Daiquiri), Oriente Province, 2,000-3,000 feet, May 30-31, 1936 (P. J. Darlington) (M. C. Z. and U. S. N. M.).

The above male differs from the type, with which it has been compared, in having the tegmina longer, the pronotum somewhat darker, and the dark blotch on the subgenital plate smaller.

Measurements. Length of body 18 mm., of pronotum 4.7 mm., of tegmen 19.5 mm., of hind tibia 6.8 mm.; width of pronotum 6 mm.

Among the three females there is little variation. The interocular width is slightly greater than interocellar width and considerably less

than the distance between the antennal sockets. The Gran Piedra specimen has a dark transverse bar on the ventral part of the face, with two dark extensions, one at each end of the bar, onto the postclypeus. The venter of the abdomen in these specimens is sprinkled with fuscous. As in the male, there is a small premarginal dark blotch on each side near the base of each segment. The subgenital plate is similar to that of related species and, in addition to a sprinkling of fuscous, has four small, dark blotches on the basal part of the disk. The supraanal plate is bilobed apically, with a transverse dark mark subbasally.

Measurements of the Gran Piedra female: Length of body 18 mm., of pronotum 5.1 mm., of tegmen 22 mm., of hind tibia 7.5 mm.; width of pronotum 6.6 mm.

#### EPILAMPRA BURMEISTERI (Guérin)

*Blatta (Phyllodromia) burmeisteri* Guérin, in La Sagra, Hist. Phys. Polit. Nat. Cuba, pp. 345-346, 1857.

*Material here recorded.* 1 female, Upper Ovando River (south of Cape Maisi), Oriente Province, 1,000-2,000 feet, July 17-20, 1936; 1 male, Yunque de Baracoa, Oriente Province, 1,000-1,800 feet, July 13, 1936; 1 male, Pico Turquino (south side), 3,000-5,000 feet, June 1936 (P. J. Darlington) (M. C. Z. and U. S. N. M.).

This species is especially distinguished by its small size and contrastingly colored tegmina with pale marginal and scapular fields and very dark basal portion of humeral trunk. The postclypeus of two of the above specimens is mostly dark. There is slight variation in the color of the face and interocular area, but there are no marked differences from the head illustrated by Rehn and Hebard (1927, pl. 17, fig. 6).

Measurements of the Turquino specimen. Length of body 14.5 mm., of pronotum 4.3 mm., of tegmen 16.5 mm., of hind tibia 5.7 mm.; width of pronotum 5.2 mm. The tegminal length of the Yunque de Baracoa specimen is 15 mm. and the body length 13.5 mm.

#### EPILAMPRA species

*Material here recorded.* 1 nymph, Upper Ovando River, Oriente Province, 1,000-2,000 feet, July 17-20, 1936; 3 nymphs, mountains north of Inias, Oriente Province, 3,000-4,000 feet, July 25-28, 1936;

3 nymphs, Pico Turquino (south side), Oriente Province, 4,500–6,000 feet, June 18–20, 1936 (P. J. Darlington) (M. C. Z. and U. S. N. M.).

These specimens range from 6.5 mm. to 19 mm. in body length and cannot be identified to species with certainty.

### Subfamily PANCHLORINAE

#### The Genus PYCNOSCELUS Scudder

*Pycnoscelus* Scudder, Bost. Journ. Nat. Hist., vol. 7, No. 3, p. 421, 1862 (genotype, *Pycnoscelus obscurus* Scudder (synonym of *Blatta surinamensis* L.), by monotypy).

#### PYCNOSCELUS SURINAMENSIS (Linnaeus)

*Blatta surinamensis* Linnaeus, Syst. Nat., ed. 10, p. 424, 1758.

*Material here recorded.* 1 female, Upper Ovando River, Oriente Province, 1,000–2,000 feet, July 17–20, 1936; 3 females, coast below Pico Turquino, Oriente Province, June 26–30, 1936 (P. J. Darlington); 1 male, 1 female, Bellevue, Antigua, Sept. 20, 1937 (H. E. Box); 1 male, Bangkok, Siam, March 1–24, 1932 (Hugh Smith). (M. C. Z. and U. S. N. M.).

It should be noted that this widespread tropical roach was first described by Linnaeus in 1758, and not in Edition 12 of the *Systema Naturae* as has been stated several times. It is rather remarkable that the genus *Pycnoscelus* was based upon an adventive immature female discovered in the hills of western Massachusetts. The author has not seen Scudder's unique type of the synonymous *obscurus*, but the description agrees so well with *surinamensis* nymphs of the same size (being very different from native New England *Parcoblatta*) that the correctness of the synonymy, generally accepted for many years, is evident.

The males of *surinamensis* are extremely rare and as far as the writer is aware were unknown from the New World until Davis (1919, p. 109) reported finding a male in the Reptile House of the New York Zoological Society. This may have been introduced from the Old World, however. If so, the Antigua specimen recorded above is the first American male. Hebard (1917, p. 194) has described a male from the Lesser Sunda Islands, and the two males in the National Museum agree with his description.

Blatchley (1920, p. 105), apparently not realizing that immature

female roaches may have styles on the subgenital plate preceding the final nymphal instar, says that it "passeth understanding" how the specimen of *obscurus* described by Scudder could be a female. Sharp (1895, p. 224) pointed out that young female roaches may have styles, and Quadri (1940, pp. 140-142) shows that female nymphs of *Periplaneta americana* (L.) have styles until the last instar preceding maturity. Other writers have also referred to the matter. Caudell (1925) described female nymphs of *surinamensis* and reported rearing experiments which showed that this species can and does produce young parthenogenetically and that the oöthecae are seldom extruded from the mother's body; the young usually being born alive.

This roach is of economic importance as intermediate host for Manson's eye worm (*Oxyuris*) of poultry and many wild birds (see Shealy, 1927). It is also well known as a greenhouse pest in the north-eastern part of the United States.

### Subfamily BLABERINAE

#### The Genus BYRSOTRIA Stål

*Byrsotria* Stål, *Bihang Till K. Svenska Vet. Akad. Handlingar*, Bd. 2, No. 13: p. 18, 1874 (genotype, *Blatta thungbergii* Guérin (synonym of *Blatta fumigata* Guérin), by monotypy).

#### BYRSOTRIA CABRERAI Rehn and Hebard

*Byrsotria cabrerai* Rehn and Hebard, *Bull. Amer. Mus. Nat. Hist.*, vol. 54, art. 1, pp. 266-268, pl. 24, figs. 1 and 2, 1927.

*Material here recorded.* 1 male, 1 female, coast below Pico Turquino, Oriente Province, June 26-30, 1936 (P. J. Darlington) (M. C. Z.); 1 male, between Cardenas and Varadero, Matanzas Province, November 1931 (H. A. Pilsbry) (A. N. S. P.).

This species was named in honor of Senor Jose Cabrera, and, because of the rules regarding the formation of specific names derived from a man's name, it seems best to emend the original spelling, which may have been accidental, to *cabreraei*.

The wing and tegminal length are variable; the tegmina of the Turquino male only slightly surpass tergum 4, and the wings do not extend beyond tergum 2, while the tegmina of the male in the Philadelphia collections recorded above are of about the same length. This condition contrasts with that of the holotype, which has tegmina reaching onto tergum 7 and well developed wings.

Measurements in millimeters of the Turquino male and female, respectively, are as follows: Length of body 33, 44.5; of pronotum 10.5, 13.5; of tegmen 16.5, 12.3; of hind tibia 12, 15; width of pronotum 16.5, 23.

The male from Matanzas Province indicates that *cabrerae* occurs in western as well as eastern Cuba.

### Subfamily CORYDIINAE

#### The Genus HOLOCOMPSA Burmeister

*Holocompsa* Burmeister, Handb. Ent., Bd. 2, Abt. 2 (1st Half), p. 491, 1838 (genotype, designated by Kirby, 1904, p. 169, *Corydia collaris* Burm. (synonym of *Blatta nitidula* F.))

#### HOLOCOMPSA NITIDULA (Fabricius)

*Blatta nitidula* Fabricius, Species Insectorum, vol. 1, p. 345, 1781.

*Material here recorded.* 1 female, Loma del Gato, Cobra Range, Oriente Province, about 3,000 feet, July 3-7, 1936 (P. J. Darlington) (M. C. Z.).

With the pubescent, orange pronotum, and tegmen divided obliquely into bluish metallic and hyaline areas, the present specimen is typical of *nitidula*, the male of which has a blackish pronotum. This domiciliary species apparently occurs even in the higher Cuban mountains. The only other described West Indian species of *Holocompsa* is *metallica* R. & H. of Hispaniola.

#### The Genus PHOLADOBLATTA Rehn and Hebard

*Pholadoblatta* Rehn and Hebard, Bull. Amer. Mus. Nat. Hist., vol. 54, art. 1, p. 286, 1927 (genotype, *Aphlebia inusitata* Rehn, by original designation and by monotypy).

#### PHOLADOBLATTA INUSITATA (Rehn)

##### Fig. 33

*Aphlebia inusitata* Rehn, Bull. Amer. Mus. Nat. Hist., vol. 22, art. 5, p. 113, 1906.

*Material here recorded.* 1 male, Soledad<sup>1</sup> (near Cienfuegos), Santa Clara Province, May 1936 (P. J. Darlington) (M. C. Z.).

<sup>1</sup> See Barbour and Robinson (1940) for a general account of the laboratory of Harvard University located at Soledad.

This specimen differs from the type (Rehn and Hebard, 1927, pl. 20, fig. 6) in having the apical margin of the tegmen broadly and evenly rounded, thus agreeing with the *Camoá* specimen recorded by the latter authors. There is a well sclerotized, gently curved phallomere dorsad of the right half of the subgenital plate. The left style is directed ventro-posteriorly and is more elongate and gradually tapering than shown in fig. 33 on account of foreshortening.

### Subfamily OXYHALOINAE

#### The Genus PLECTOPTERA Saussure

*Plectoptera Saussure*, Mém. Hist. Nat. Mex., Mém. 4, p. 173, 1864, (genotype, designated by Rehn, 1903, p. 281, *Blatta porcellana* Saussure).

Of the 10 West Indian species of *Plectoptera* treated by Rehn and Hebard (1927), the following 4 occur in Cuba: *porcellana* (Sauss.), *vermiculata* R. & H., *lacerna* R. & H., and *poeyi* (Sauss.). Because the differences in color and in male genitalia were freely illustrated by Rehn and Hebard (l. c.), a key is not presented here.

#### PLECTOPTERA PORCELLANA (Saussure)

*Plectoptera porcellana* Saussure, Rev. at. Mag. Zool., Ser. 2, Vol. 14, p. 164, 1862.

*Material here recorded.* 2 males, Loma del Gato, Cobre Range, Oriente Province, about 3,000 feet, July 3-7, 1936; 1 male, 1 female, Pico Turquino, 5,000-6,000 feet, June 1936; 1 male, same (south side), 3,000-5,000 feet; 1 female, Buenos Aires, Trinidad Mts., Santa Clara Province, 2,500-3,500 feet, May 8-14, 1936 (P. J. Darlington) (M. C. Z. and U. S. N. M.).

In the color of head, pronotum, and tegmina and in the directions in which the appendages of the male subgenital plate are bent the variation in these specimens agrees with previous information about *porcellana*. It is of interest to find *porcellana* near the summit of Turquino, and it probably occurs throughout Cuba.

### SUMMARY

This paper is a report on a collection of roaches made in Cuba during 1936 by P. J. Darlington. Sixteen genera are treated, and an attempt has been made to consider each comprehensively as far as Cuba is

concerned; in several cases the entire West Indian fauna or an entire genus is reviewed. A new subspecies of *Ischnoptera ligula* R. & H. is described and 9 new species, the latter in the genera *Neoblattella*, *Ischnoptera*, *Nelipophygus*, *Symploce*, *Eurycotis*, and *Audreia*. The consideration of *Eurycotis*, including a key to the 22 West Indian species, descriptions of 4 new species, and 2 plates of illustrations, is one of the more comprehensive sections of the report. Several species are discussed about which very little has previously been known. Variation has been considered important in the treatment of species, and the generic diagnosis of *Nelipophygus* has been modified so that a new species may be referred to that genus. A list of West Indian Blattidae described since 1927, when a revision by Rehn and Hebard appeared, has been compiled. Because of homonymy, a new specific name, *tepperana*, is given to *Blatta rufa* (Tepper) of Australia.

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## TEPPER, J. G. O.

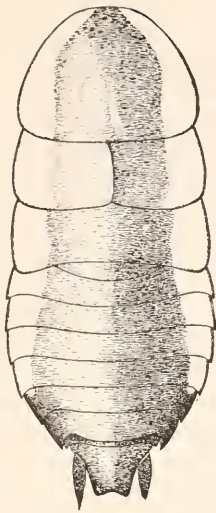
1893. The Blattariae of Australia and Polynesia. *Trans. Roy. Soc. S. Aust.*, vol. 18, pp. 25-130.

EXPLANATION OF PLATES

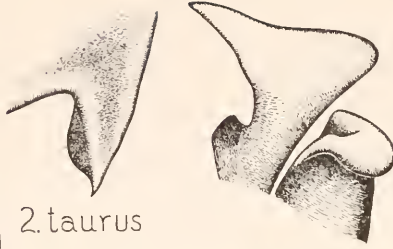
PLATE 1

PLATE 1

- Fig. 1. *Eurycotis rhodae*, new species, female. Dorsal view.
2. *E. laurus* R. & H., female. Dorsal view of latero-posterior process of tergum 7. Coast below Pico Turquino, Oriente Province, Cuba, June 26-30, 1936.
3. *E. fugacis*, new species, male. Ventro-mesal view of right phallomere.
4. *E. tibialis* Hebard, male. Ventral view of right hind tibia. Holotype.
5. *E. opaca* (Brunner), female. Dorsal view of latero-posterior process of tergum 7. San Diego de los Banos, Pinar del Rio Province, Cuba, April 22, 1900.
6. *E. torquinensis* R. & H., male. Same view as in fig. 3. Pico Turquino (south side), Oriente Province, Cuba, 3,000-5,000 feet, June 1936.
7. *E. famelica*, new species, female. Dorsal view.
8. *E. fugacis*, new species, female. Dorsal view.
9. *E. caudellana*, new species, female. Dorsal view.



1. rhodae



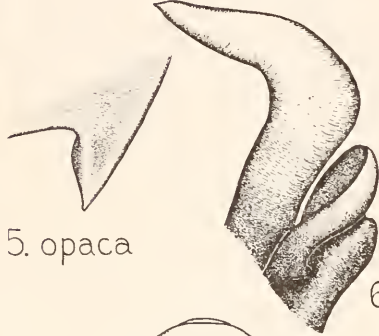
2. taurus



3. fugacis

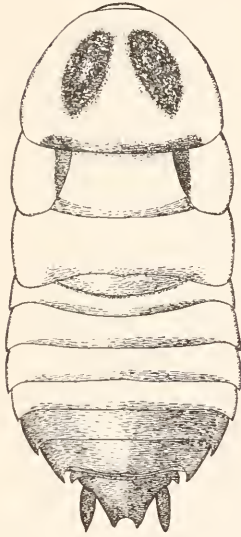


4. tibialis

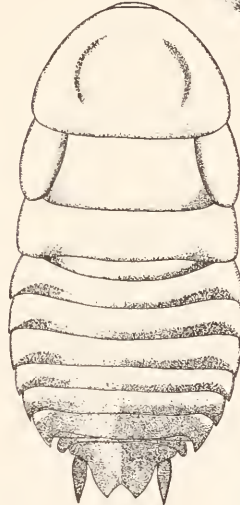


5. opaca

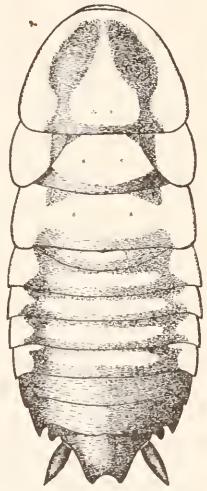
6. torquinensis



7. famelica



8. fugacis



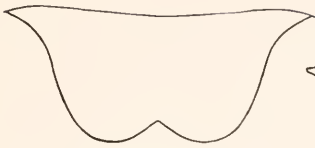
9. caudellana

PLATE 2

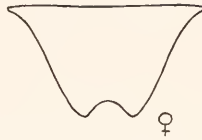
PLATE 2

- Fig. 10. *Eurycotis tibialis* Hebard, Male. Dorsal view of supraanal plate Holotype.
11. *E. torquinensis* R. & H., female. Same view. Same data as in fig. 6.
12. *E. lixa* Rehn, male. Same view (after Rehn, 1930).
13. *E. fugacis*, new species, male. Same view (apex deformed).
14. *E. opaca* (Brunner), female. Same view. Same specimen as in fig. 5.
15. *E. lixa* Rehn, male. Dorsal view of left tegmen (after Rehn, 1930).
16. *E. opaca* (Brunner), male. Dorsal view of supraanal plate. Santiago de Las Vegas, Havana Province, Cuba, April 1905.
17. *E. taurus* R. & H., female. Same view. Same specimen as in fig. 2.
18. Same, male. Same view (after Rehn and Hebard, 1927).
19. *E. fugacis*, new species, male. Frontal view of head.
20. *E. tibialis* Hebard, male. Dorsal view of left tegmen. Holotype.
21. *E. famelica*, new species, female. Same view as in fig. 19.

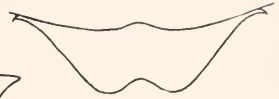




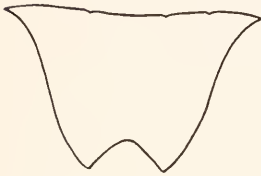
10. tibialis ♂



11. torquinensis ♀



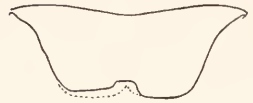
12. lixa ♂



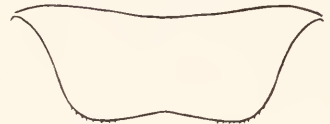
14. opaca ♀



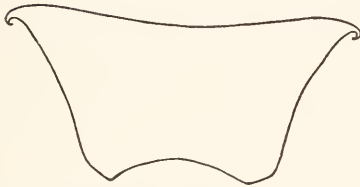
15. lixa



13. fugacis ♂



16. opaca ♂



17. taurus ♀



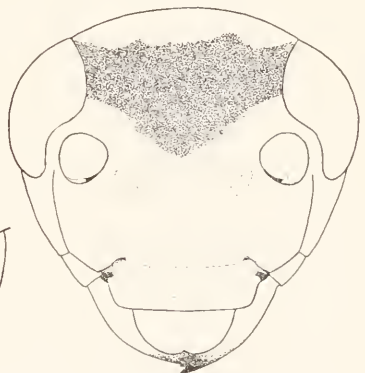
18. taurus ♂



19. fugacis



20. tibialis

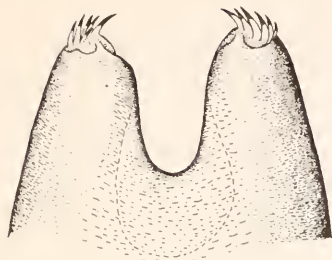


21. famelica

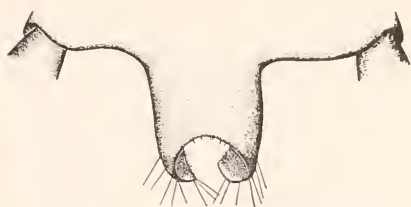
PLATE 3

PLATE 3

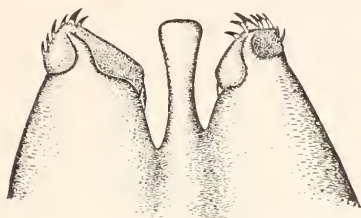
- Fig. 22. *Cariblattoides instigator* R. & H., male. Ventro-posterior view of subgenital plate. Gran Piedra Range, Oriente Province, Cuba, 2,000–3,000 feet, May 30–31, 1936.
23. Same, male. Same view. Mountains north of Imias, Oriente Province, Cuba, 3,000–4,000 feet, July 25–28, 1936.
24. *Aglaopteryx mira* Rehn, male. Ventral view of subgenital plate. Loma del Gato, Cobre Range, Oriente Province, Cuba, about 3,000 feet, July 3–7, 1936.
25. *Ischnoptera ligula collina*, new species, male. Dorsal view of supra-anal plate. Paratype from Loma del Gato.
26. Same, male. Dorso-posterior view of subgenital plate. Holotype.
27. *I. darlingtoni*, new species, male. Dorso-posterior view, slightly from left side, of right style. Holotype.
28. Same, male. Posterior view, from left side, of left paraproct. Holotype.
29. Same, male. Posterior view, from right side, of right paraproct. Holotype.
30. Same, male. Dorso-posterior view, slightly from left side, of subgenital plate. Holotype.
31. Same, male. Dorsal view of apex of abdomen. Holotype.



22. instigator



25. collina



23. instigator



24. mira



26. collina



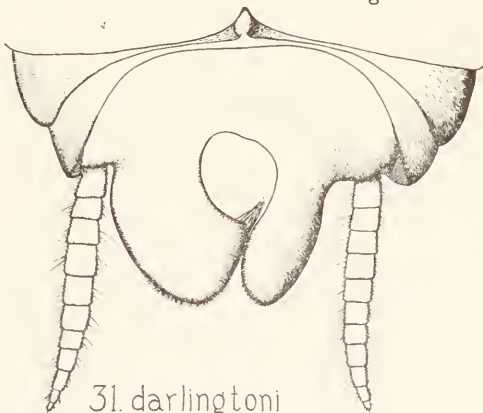
29. darlingtoni



28. darlingtoni



27. darlingtoni



31. darlingtoni



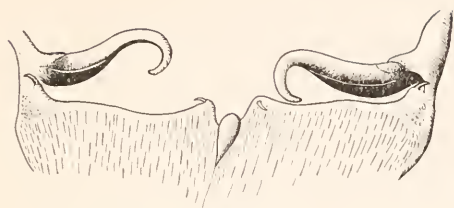
30. darlingtoni

PLATE 4

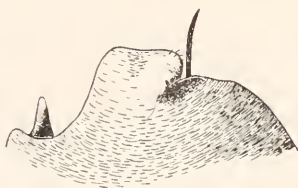
PLATE 4

- Fig. 32. *Neoblattella guanayara*, new species, male. Ventro-posterior view of subgenital plate. Holotype.
33. *Pholadoblatta inusitata* (Rehn), male. Ventro-posterior view of subgenital plate. Soledad (near Cienfuegos), Santa Clara Province, Cuba, May 1936.
34. *Nelipophygus banksi*, new species, male. Ventral view of subgenital plate. Holotype.
35. Same, male. Dorsal view of left tegmen. Holotype.
36. Same, male. Apical view of claws and associated structures of left hind tarsus. Holotype.
37. Same, female. Dorsal view of supraanal plate. Allotype.
38. *Neoblattella vatia* R. & H., male. Ventral view of subgenital plate. Pico Turquino (south side), Oriente Province, Cuba, 1,500 feet, June 25, 1936.
39. *Symploce munda*, new species, male. Ventral view, considerably from left side, of subgenital plate. Holotype.
40. *Epilampra cubensis* Bolivar, female. Dorsal view of right tegmen. Cuchillo de Guajimero (near Imias), Oriente Province, Cuba, about 2,000 feet, July 25, 1936.
41. *Audreia exploratrix*, new species, female. Dorsal view, from left side, of left tegmen. Paratype.
42. Same, male. Ventral view of subgenital plate. Holotype.
43. Same, male. Dorsal view. Holotype.

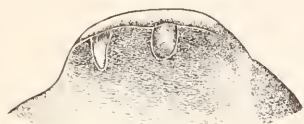
(All drawings by the author)



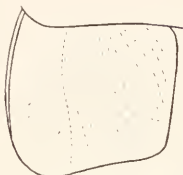
32. *guanayara*



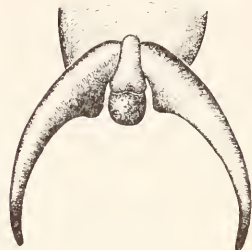
33. *inusitata*



34. *banksi*



35. *banksi*



36. *banksi*



38. *vatia*



41. *exploratrix*



37. *banksi* ♀



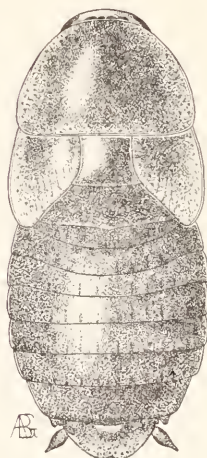
40. *cubensis*



39. *munda*



42. *exploratrix*



43. *exploratrix*